Charles University

Faculty of Science

Study programme: Demography

Branch of study: Demography and Sociology

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Demographic view on the population of New Zealand in the period 1991–2018

Demografický pohled na populaci Nového Zélandu v období 1991–2018

Bachelor´s thesis

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Prague, 2020

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V Praze, 2020

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Hana Třísková

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I hereby proclaim that I wrote the bachelor thesis on my own and that the references include all resources and literature I have used. This thesis or its fundamental part have not been used previously for acquiring another university degree.

In Prague, 2020 _____

Hana Třísková

Acknowledgments

I would like to express my gratitude to RNDr. Klára Hulíková Tesárková, Ph.D. for her valuable suggestions, time and patient supervision. My special thanks go to my family for support throughout the study, patience and great support.

Demographic view on the population of New Zealand in the period 1991–2018

Abstract

The objective of this study is to characterize the key events (economic, social and historical), which occurred during the 20th century, that subsequently influenced New Zealand´s population development and population structure in the period between 1991–2018. This period was determined based on the data availability and the presumption that the impact of the selected events started to manifest on the population after 1991. To describe the population structure, we used age pyramids, aged-child ratio, young-age dependency ratio, old-age dependency ratio and mean age. For description of demographic processes of fertility, mortality and nuptiality in the studied period, basic indicators were used, which allowed us to fulfil the aim of the thesis. Data for their calculation was taken from the online database of the New Zealand Statistical Office, *Infoshare* and selected publications. The first part of the work introduces the natural conditions of New Zealand and briefly outlines its historical development. The second part is devoted to the characteristics of the population according to age, religion, ethnicity and education as well as to the selected demographic processes. Based on the studied literature, we identified World War II, the baby boom, women´s emancipation and improved health care as the key events and processes. In the monitored period, these facts were reflected in decreasing fertility rates, growth in the mean age at childbearing, growth in the mean age at first marriages, increasing life expectancy and decreasing mortality levels.

Keywords

New Zealand, key events, World War II, baby boom, women´s emancipation, population ageing

Characters

104 649

Demografický pohled na populaci Nového Zélandu v období 1991–2018

Abstrakt

Cílem této práce je charakterizovat klíčové události (ekonomické, sociální a historické) odehrávající se v průběhu 20. století, které ovlivnily populační vývoj a strukturu obyvatelstva Nového Zélandu v období 1991–2018. Toto období bylo stanoveno na základě dostupnosti dat a předpokladu, že se vybrané události začnou projevovat na novozélandské populaci po roce 1991. K popisu struktury obyvatelstva bylo použito věkových pyramid, indexu stáří, indexu ekonomické závislosti I a II a průměrného věku. K popisu demografických procesů porodnosti, úmrtnosti a sňatečnosti ve sledovaném období bylo použito základních ukazatelů, které umožňují naplnit cíl práce. Data pro jejich výpočet byla čerpána z online databáze Statistického úřadu Nového Zélandu, *Infoshare*, a vybraných publikací. První část práce seznamuje s přírodními podmínkami Nového Zélandu a stručně nastiňuje jeho historický vývoj. Druhá část práce je věnována charakteristice obyvatelstva podle věku, náboženského vyznání, etnické příslušnosti a vzdělání stejně tak i zvoleným demografickým procesům. Na základě studia literatury jsme jako klíčové události a procesy identifikovali druhou světovou válku, baby boom, emancipaci žen a zkvalitnění zdravotní péče. Tyto skutečnosti se ve sledovaném období promítly do klesajících hodnost porodnosti, růstu průměrného věku matek při narození dítěte, růstu průměrného věku snoubenců při uzavírání sňatku, zvyšující se naděje dožití nebo snižující se úrovně úmrtnosti.

Klíčová slova

Nový Zéland, klíčové události, druhá světová válka, baby boom, emancipace žen, stárnutí populace

Počet znaků

104 649

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Abbreviations and acronyms

NZ	New Zealand
OECD	Organisation for Economic Co-operation and Development
SUDI	Sudden unexpected death in infancy
UNFPA	United Nations Population Fund
UK	United Kingdom
WHO	World Health Organization
YB	Yearbook

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Chapter 1

Introduction

Although New Zealand is a small country in terms of population and remains a somewhat wider demographic interest, its population development underwent a number of significant changes. These changes began in the second half of the 18th century, in connection with the colonization of Europeans, especially the British one. Before New Zealand was discovered by a Dutch sailor Abel Tasman in 1642 and before the interest in its mineral resources started in the second half of the 18th century after Cook´s expeditions, nothing else than natural conditions and events affected its population. However, the arrival of Europeans influenced its development. The indigenous people, Maori, were forced to adapt to the British way of life, which was not always completely conflict-free. In addition to a new way of life, the British also brought with them new illnesses, weapons that caused many more deaths in conflicts and gradually transformed New Zealand into a colony that reflected the European way of life and demographic behaviour (Sinclair, 2003, p. 8–70).

Over the course of the 20th century, most of the world´s developed countries faced a large number of events and processes that severely affected their populations and caused significant changes that influenced their future development. Worth mentioning is the demographic and the epidemiological transition, World War I and World War II, post-war baby boom and population ageing. The position of women in society has also begun to change. While formerly their main task was to take care of households and children, as a result of World War II, they had to become more involved in the labour market, and their involvement in the second half of the 1970s began to deepen even more. Women have increasingly begun reaching higher education and establishing their working careers. With that, their interest in family has also begun to subside. This was reflected in the increasing age of childbearing for women and the decline in the number of marriages. The emancipation of women was also significantly helped by the favourable economic situation, which required a higher number of workers with the highest level of education (Else, 2011). Many authors, such as Richard Easterline, Diane Macunovich or Butz and Ward, are concerned with women´s participation in the labour market and their economic independence from men in relation to changes in fertility, decreasing interest in family formation and number of marriages (Freedman 1976, Macunovich 1999, Butz and Ward 1979).

The motivation for writing this bachelor thesis was the personal interest in this topic and its potential broader use, such as comparing population development of British colonies, where one might expect their development would be very similar. Another reason for writing this thesis was the fact that the topic of New Zealand's population is not paid as much attention in the Czech Republic as it is in the case of other Anglophone countries, especially Great Britain, United States and Canada. As New Zealand possesses the quality data related to its population development, this thesis can serve as a base for future studies, for example related to population development of Commonwealth countries.

The aim of this bachelor thesis is to introduce the history of New Zealand and the key events that intervened in its population structure and development. Given the limited scope of this work, we focus more closely on the demographic development of indicators in the period between 1991–2018. This range was chosen because of the unified data available and also, because of the fact that, during this period, the impact of the events occurring in the second half of the 20th century, started to influence the current New Zealand´s population development. These are mainly the entry of the generations born during the baby boom (1945–1973) into retirement age, population ageing, emancipation for women and decreasing numbers of marriages and births. The aim of this work is not to provide an exhaustive description of the development of demographic processes, but to acquaint one with its basic development, to explain its fluctuations in relation to events that could have influenced it. In order to fulfil the objectives of this thesis, we will set several research assumptions, based on the relevant literature, that will be developed with the help of the empirical research. We suppose that answering those assumptions will provide us arguments to support or define our hypotheses (see Chapter 2.2).

This work consists of seven chapters. The first chapter is a general introduction to the situation, which acquaints readers with the aim of the thesis and its structure. The second chapter gives a basic overview to the available literature, hypotheses and research assumptions. The third chapter is devoted to the description of the methodology and data resources. The fourth chapter deals with the characteristics of the country's natural conditions and the striking outline of its history. The fifth chapter presents the basic characteristics of the population: age, ethnic, religious and education structure. The sixth chapter presents the development of selected indicators related to fertility, mortality and nuptiality. The final chapter summarizes the findings, responds to the hypotheses posed in the second chapter and outlines the future possible use of the acquired knowledge for further work on this issue.

Chapter 2

Review of literature, hypotheses and research assumptions

The following chapter is dedicated to the description and discussion of the literature related to the subject of the thesis, dealing with selected areas of the population development and history of New Zealand. As New Zealand is not in the centre of interest to Czech researchers, the studied publications originate from foreign institutions. The first part of this chapter deals with the literature related to the history of New Zealand, the second part is focused on publications related to the population structure and demographic processes (fertility, mortality and nuptiality). In this chapter we also determine hypotheses and research assumptions based on those we chose methods and used data described in Chapter 3.

2.1 Related literature

The main work that comprehensively describes New Zealand's history from its earliest times, the Maori settlements, the wheels of Europeans, throughout the 20th century, is the publication of Keith Sinclair *Dějiny Nového Zélandu*. Here the author described the key events, the causes of their origin and their consequences. Part of the book is focused on describing the society, especially in connection with the colonization of Europeans and addressing new living conditions, establishing relationships with Maori and the conflicts that occurred between these two groups. The connections with the emancipation of women from the end of the 19th century and the period of the Second World War are outlined there, as well as the political struggles between the parties at the end of the 20th century (Sinclair, 2003). Another publication that present the history of New Zealand is *Concise History of New Zealand*, written by Philippa Smith (Smith, 2012).

The first major event that affected New Zealand´s population development in the first half of the 20th century was the First World War. Due to the fact that New Zealand was part of the Commonwealth, its participation in this conflict was requested. New Zealand's involvement in the war is described in detail on the site New Zealand History, created by the Ministry for Culture and Heritage, where we can find articles related to the course of the war and its consequences on New Zealand's population after the war (Ministry for Culture and Heritage, 2016).

In 1939, in connection with World War II, New Zealand joined the United Kingdom as an ally. A comprehensive description of World War II from its beginning, course and end can be found in the book *Dějiny druhé světové války 1939–1945* (Grečko, 1978). The information about the involvement of New Zealand in the war, including war losses, fights, changes in society, can be found in the articles on the site *New Zealand History* and also *Te Ara Encyclopaedia*. Information can be found about the history, natural conditions, culture, society and all other aspects of New Zealand. The advantage of this online source stems from the fact that the articles are written by the leading experts in the field.

Most developed western countries faced an unexpected increase in fertility in the mid-20th century. This period, known as the "baby boom era," is one of World War II´s consequences, especially because the soldiers returned. However today, most research attaches greater importance to the economic development after the war. This rapid development initially caused rising fertility, but later it caused a decline, which has been continuing up to the present day (Sánchez-Barricarte, 2018, p. 1190–1212).

Even in New Zealand, there was a baby boom period in 1945–1973. During this time, the total fertility rate reached the value between 3 and 4, which was one of the highest values among the western developed countries (Pool, 2007, p. 141–161). After World War II, the number of births began to increase, reaching its first peak in 1961. Then, it began to decline gradually, but as the first generations of baby boomers began to come into their reproductive age, values started rising again after 1970. There are several reasons, why this baby boom occurred. During the 1930s world economic crisis and then as a result of World War II, fewer marriages were entered and fewer children were born. The traditional family was disrupted because young men went to fight, often fell in combat, women had to represent them in a variety of work areas, and the economic situation was not favourable because the state´s war spending was high. The subsequent return of men from the ballot, especially in the first post-war years, led to an increase in numbers of marriages, as well as a higher number of births. (Stat NZ, 1995, p. 2–3).

Greater women´s emancipation and economic development created new conditions for family formation in the second half of the 20th century and had an impact on declining fertility rates. However, the gender pay gap still persists in the labour market. Almost half of the women engaged in the labour market are concentrated in 20 occupations, such as saleswomen, clerks and teachers. In addition to the different representation of women and men between professions, there are also considerable differences in financial remuneration. Wage discrimination was still legal in New Zealand until 1960, when the Government Service Equal Pay Act was adopted. There are several reasons why women still receive lower salaries today. Among the most commonly reported is the view that a woman should perform primarily the role of wife and mother and should continue to be more important to her private sphere than the working one. Financial care for the family should continue to be provided primarily by the man (Zwi, 2016, p. 8–12).

One of the theories that try to explain the changes in fertility values during the second half of the 20th century on the basis of economic conditions, belongs to *Richard Easterline´s*. According to his theory, fertility follows a cycle of forty years. If an individual is born into a cohort that has low fertility, then it means that on average he will have much less competition for a certain period

when entering the job. This is also associated with better wages and career prospects. Conversely, a person born into a high-fertility cohort will have to face greater competition in the labour market. The theory consists of two parts: the first part says that when there is a shortage of young workers on the market, these people have a much better chance of getting a better job and the related salary. As a result, people can also achieve a higher standard of living. This fact is reflected in the increasing number of marriages and thus also in the growing number of children born. In 20 years, the opposite effect is supposed to occur. There will be a large number of young workers on the labour market. People will be exposed to more competition and their living standard will not increase as quickly as they did before (Freedman, 1976, p. 411–415).

The second part of the theory concerns relative income. Income factors that affect fertility and nuptiality include: potential income of the couple, material claims and social experience. With increasing intake, less economic pressure is exerted on the couple. They have more options, not only in terms of career development, but can also spend their free time more diversely, and therefore they postpone weddings more and thus postpone having children until reaching a higher age (Freedman, 1976, p. 411–415).

Diane Macunovich (1999) formulated another theory related to changes in fertility and women´s economic independence. Its model measures fertility based on the relationship between relative income and female salary. While the Easterlin´s theory assumes that women play a passive role. Macunovich adds a factor of female salary and considers the woman´s role to be crucial. Between 1960–1980, women became financially independent from their husbands, entered the workforce and began to achieve higher education. Marriages began to be postponed and fertility began to decrease. Makunovic believes that as female relative income grew, fertility decreased. On the other hand, if women´s income grows, it puts pressure on the number of children born. It means that according to this theory, increasing a woman´s income has a negative impact on the fertility values (Macunovich, 1999, p. 155–192).

The changing economic position of women in the second half of the 20th century can be seen in New Zealand as well as changes in fertility which are the key elements of Diane Macunovich´s theory. After World War II, in New Zealand, it became more socially acceptable for a married woman to go to work. However, there were still jobs reserved only for men and in addition women´s salaries were unequal to men's, because women were not believed to have the same abilities as men. The problem of wage inequality persists to the present, although this gap has been decreasing every year. With the advent of the 21st century, it became a common place for women in New Zealand to go to work to be able to secure not only themselves but also their children (Else, 2011).

Since women´s participation in the labour market, we can see changes in fertility rates. While in 1950 the total fertility rate in New Zealand was around 3.5, and in the course of the baby boom it exceeded over the value 4, since the late 1970s it has been gradually decreasing to below the replacement level, with a value 1.7 in 2018 (Stat NZ, 2020ch). The New Zealand government responded to declining fertility in 2006 with the release of a plan called the Choices for Living, Caring and Working ten-year, which aimed to improve conditions for working parents and enable them to better combine working and family life. The decrease in total fertility rate is also related

to postponing childbearing to an older age (mean age at childbearing in 2018 was over 30). This is due, among other things, to the achievement of women´s tertiary education and subsequent entry into employment in their later 20s (Callister and Didham, 2007, p. 4–9).

In their theories, Richard Easterline and Diane Macunovich deal with the economic emancipation of women and its possible impacts on the fertility and nuptiality development. Despite the fact that these theories are not directly linked to New Zealand, we can identify, based on the available literature, the changes that have started to take place in the period of women´s participation in the labour market. It is mainly a decline in fertility and nuptiality. In other parts of the thesis, these theories can be used to explain changes in the development of selected indicators and thus can help to explain women´s behaviour and the reasons that led to changes in their decision-making in the areas of work, education, nuptiality and fertility.

Another current demographic problem in New Zealand is the significant ageing of the population, as generations born during the baby boom period are now retiring. The ageing population is a global problem. In 2019 there were more than 700 million over 65 years of age. Over the next 30 years, the number of older people is expected to be more than double, reaching over 1.5 billion in 2050 (United Nations, 2019, p. 5). The age in of the population is the result of a drop of high values of fertility and mortality to low values. It is not the primary consequence of the baby boom, even if it affects it partially (Phillipson et al., 2008, p. 1–5).

There are 4 dimensions of population ageing (Jackson, 2011, p. 2–5):

1. *Numerical ageing*: this is the absolute increase of elderly people in the population due to the increase of life expectancy
2. *Structural ageing*: it is an increase in the proportion of elderly people in the population, caused by a decline in fertility and hence a decrease in the number of young people in a population
3. *Natural decline and absolute decline in population*: as a result of the increased representation of the elderly in the population, there will be a shift to a natural decline in population, which in turn, will increase the number of deaths rather than births. Absolute decline happens in case that the migration cannot counterbalance the decrease of births and the increase of deaths in the population which is particularly the issue in those areas where the retirees are moving.

New Zealand will face numerical ageing, which will place increased demands on the provision of services, health care and pensions for the elderly, but also structural ageing, as the lack of young people in the population will be a major problem (Jackson, 2011, p. 5–10).

2.2 Hypotheses and research assumptions

In the following part, we will define the hypothesis and the research assumptions on which we will be focusing during this bachelor thesis and which will serve as the basis for fulfilling the aim of this work. We will answer them based on the study of the literature as well as based on the calculation of selected demographic indicators and present their development in the examined period.

The aim of this thesis is, firstly, to describe the essential demographic processes within the period of 1991–2018, then characterize New Zealand´s population based on age, ethnic, religious and education structure as well as to present key historical, economic and social events which has had an impact on its population. To fulfil this aim, we state the following hypothesis:

The population development of New Zealand between 1991–2018 was influenced by the historical, economic and social changes that occurred during the 2nd half of the 20th century.

To evaluate this hypothesis, we defined the research assumptions based on the literature review (see Chapter 2.1). In order to be able to confirm or deny our hypothesis, we set 2 research assumptions:

1. *As the first generations of baby boomers (1945–1973) are retiring, the population ageing becomes a key social and political issue as the economic impacts, such as pensions, tax income, health care, will have crucial consequences on the population.*

The ageing of the population is a global phenomenon that puts pressure on the economic and social spheres. The increasing number of people aged 65 and more requires sufficient resources for them, such as nursing homes, leisure time activities, or pensions. Its main causes are a decrease in the number of births and increasing life expectancy (UNFPA, 2012, p. 12–17). These two factors are causing a gradual ageing of the population, but in New Zealand this issue has been increasingly coming to the forefront in recent years as generations of people born during the baby boom (1945–1973) are beginning to enter the retirement age. Although it could be expected that these generations also had a lot of children, it was exactly the opposite. These generations had fewer children than their parent's generation.

For New Zealand, population ageing will be a major problem. In addition to the economic issues mentioned above, industry and agriculture are expected to be affected. For example, agriculture is mainly linked with older people and it is therefore a question who will take over their farms later. Also, the provision of health care, pensions, cemetery formation and adaptation of public transport to seniors will pose problems, these are already very topical (Jackson, 2011, p. 5–10). The aim of the government is to inform citizens as much as possible about the principles of a healthy lifestyle, which is crucial to stay fit and self-sufficient for a longer period. To this, a number of programs and plans have been drawn up to increase public awareness. They are for example: Primary Health Care Strategy, Review of Adult Palliative Care Services, New Zealand Framework for Dementia Care and many others. Many of the factors affect how we age. Genetic predispositions play a role, as well as the lifestyle in adult life and the environment in which we live, financial conditions which, if are bad, can cause stress, a family situation where it is very important not to remain lonely at an older age cause deep depression. For this reason, various associations are formed, bringing together people of different ages and providing them with leisure activities in the form of seminars, excursions, playing various games or clubs (Ministry of Health, 2016, p. 7–14).

2. *During the second half of the 20th century, thanks to better economic conditions and possibility to access to higher education, the traditional family was no longer women´s primary interest as they preferred to focus on their careers. This was one of the reasons for shifting maternity into higher age and decrease of fertility.*

In the first half of the 20th century, the main task of a woman was to take care of the household and raise children. The financial security of the family was the concern of the man who was also considered the head of the family (Daley, 2010). The situation has changed in connection with World War II. Until this time, women were employed mostly as teachers and nurses. However, during the war, women had to take up the professions that men had previously performed. After the men returned home, it was assumed that women would once again focus on the family and men on its security. There was indeed a period of increased fertility after the war, but this was not directly due to the return of men from the war, but rather the fact that young women, who wished to participate in the labour market, did not have this possibility since the places suitable for them were already occupied by other women. Therefore, they had no choice but to marry at a young age so their husband took care of them (Macdonald, 2011).

In the 1970s, liberal movements in New Zealand came to the forefront, calling the society sexist, favouring men at the expense of women. This led to unequal working conditions and salaries, the number of women in the political sphere, and the division of housework. This has become a key issue, so the government had to focus on it and started to prohibit such discrimination by law. In this way women have become more educated and got better and well-paid jobs (Macdonald, 2011).

Based on these new changes within the society, we can assume that the role of women and men have interchanged. By this we mean that women have probably started to focus more on their careers, which could have affected the age at which they started to get married and also the mean age at childbearing. Therefore, we suppose that these historical, economic and social events might have impacted significantly the population development within our defined period, however, these assumptions will have to be verified in the empirical part of this thesis.

To confirm or disprove these assumptions, we will study the development of fertility, mortality and nuptiality, within the period of 1991–2018, using selected basic indicators, chosen to best illustrate the expected trends that are described in Chapter 3. Based on this study, it will be possible to find a trend in their development and a link it to historical, social and economic events that might have caused it.

Chapter 3

Data and methodology used in empirical part

In this part of the thesis, we would like to introduce used indicators for the description of fertility, mortality and nuptiality in New Zealand in the period 1991–2018 and the way of their calculation. At the same time, we would also like to describe the data used and their availability on the websites of the institutions.

3.1 Indicators of age structure

The age structure of the population is the result of previous development of demographic processes and the current structure. It can tell us its expected future development. There are many indicators and means of age structure. For the purposes of this thesis, we have chosen basic indicators and a mean age, not only because of their frequent use and thus also possible international comparison, but also because they are sufficient to meet our goals and for readers to understand well. The age limits for the definition of individual groups of the population, which are set in this work are not universal and can be defined differently. These boundaries were established on the basis of their delineation in the used literature.

Mean age

Mean age is the weighted mean of years spent by members of a given population (Pavlík et al., 1986, p. 120).

$$\bar{x} = \frac{\sum(x + 0{,}5) * P_x}{\sum P_x}$$

x is the completed age

P_x is mid-year population at the age x

Aged-child ratio

The aged-child ratio (*achr*), which is defined as the proportion of post-productive age group (P_{65+}) and child component ($P_{0–14}$), was used to express the age structure. This means that it indicates the number of people aged 65 and over per 100 people aged 0–14 (Siegel and Swanson, 2004, p. 159).

$$achr = \frac{P_{65+}}{P_{0-14}} * 100$$

P_{65+} is the population aged 65 and more years

$P_{0–14}$ is the population aged 14 and less

In terms of economic activity, the population is divided into a child, productive and post-productive components. Based on this distribution, we can use a young-age dependency ratio and an old-age dependency ratio to express the ratio between economically active and inactive populations.

Young-age dependency ratio

The young-age dependency ratio (*yadr*) is defined as the proportion of child and productive components of the population (Eurostat, 2018b).

$$yadr = \frac{P_{0-14}}{P_{15-64}} * 100$$

$P_{0–14}$ is the population aged 14 and less

$P_{15–64}$ is the population between the ages of 15 and 64

Old-age dependency ratio

The old-age dependency ratio (*oadr*) is defined as the proportion of post-productive and productive components of the population (Eurostat, 2018a).

$$oadr = \frac{P_{65+}}{P_{15-64}} * 100$$

P_{65+} is the population aged 65 and more years

$P_{15–64}$ is the population between the age of 15 and 64

Age pyramids

The age structure is the result of demographic processes (fertility, mortality, and migration) and age pyramids show us in their notches the changes that have occurred in the population structure. Axel Gustav Sundberg, a Swedish demographer, divided the population by age into three groups: child (0–14 years), reproductive (15–49 years) and post-reproductive (50 and more years). The reproductive component is based on the fertile age of women. It is also determined that the

reproductive component is always around 50 percent of the population. Based on the representation of the child and post-reproductive components, we distinguish a total of 3 population types (Pavlík et al., 1986, p. 117–118):

1. progressive: the child component prevails over post-productive one
2. stationary: the child and post-productive components are almost in balance
3. regressive: the post-productive exceeds the child component

The progressive type of pyramids is characterized by a high level of fertility, but this is often offset by high mortality. If this population succeeds in reducing mortality, the usual result is population growth. This type occurred in historical populations, but even today it can be found in developing countries such as Chad or Rwanda. In the stationary age structure, the child and post-production components are almost torn out. This means that populations with this type do not grow or fall. This type can be found, for example, in France and the USA. The last type is a regressive structure. In this case, the post-reproductive component prevails over the child. This type is now prevalent in most developed countries, such as New Zealand, Japan, and the Czech Republic, and is characterized by a reduction in population size in the long term (Hulíková Tesárková and Dupalová, 2014, p. 20).

Age pyramids illustrate the age structure very well, and in this thesis they will help us to show, how it has changed in New Zealand over the last decades to the present, and with the notches in these pyramids, we will be able to determine when the population structure has changed and what events could cause these changes.

3.2 Selected indicators for fertility description

Fertility is one of the essential components of demographic reproduction. This process was chosen for our study as the events that occurred in the second half of the 20th century influenced particularly women´s decision to start a family and how many children they would have. Indicators used in this thesis for its description are: age-specific fertility rates, total fertility rate and mean age at childbearing.

Age-specific fertility rate (ASFR)

ASFR is defined as the number of live births to women of a specific age per women at that specific age. It is an important and often published set of indicators even in international comparisons. Age-specific fertility rates can be constructed for individual ages or age groups. While fertility rates by age units are used for further calculations (e.g. total fertility rate, gross and net reproductions rates), fertility rates by five-year age groups are most commonly used (Pavlík et al., 1986, p. 295). In this thesis, because of the data availability, we used data of women for the ages between 13 to 47.

$$ASFRx = \frac{N_x^v}{{}_{1.7}P_x}$$

N_x^v is number of live births to women of a certain age between 13 to 47 years

${}_{1.7}P_x$ is mid-year female population at the age x

Total fertility rate (TFR)

Total fertility rate is the number of children that would be on average live-born to a woman during her entire reproductive age if the fertility rates of women did not change during that period and remained at the level of the year for which total fertility rate is calculated. It is assumed that women will have no mortality during the reproductive cycle. It is a well-comparable indicator in time and space. In calculation, it is a sum of fertility rates by age units and age groups (Pavlík et al., 1986, p. 296).

$$TFR = \sum ASFR_x$$

$ASFR_x$ is age-specific fertility rate

Mean age at childbearing (MACB)

"The mean age of women when their children are born. For a given calendar year, the mean age of women at childbearing is calculated using the fertility rates by age as weights. When calculated in this way, the mean age is not influenced by a specific population structure (number of mothers in each age group)" (United Nations, 2020).

$$MACB = \frac{\sum x_c * ASFR_x}{\sum ASFR_x}$$

x_c is the center of age interval

$ASFR_x$ is the age-specific fertility rate

3.3 Selected indicators for mortality description

Mortality is the second key component of demographic reproduction. This process was chosen for our study as during the second half of the 20th century, the medicine and the health care process made significant improvements which has had direct impacts on the increasing life expectancy in the population. To describe mortality in the first year of life, we used infant mortality rate, neonatal mortality rate and post-neonatal mortality rate and direct method of standardization.

Infant mortality rate (IMR)

The infant mortality is used to express mortality in the first year of life and is calculated as the number of deaths at the age of 0–364 days per 1 000 live births in a particular calendar year. It is

used in international comparisons as it reflects the maturity of the country, the standard of living and the quality of health care (Pavlík et al., 1986, p. 142).

$$IMR = \frac{D_0}{N^v} * 1000$$

D_0 is the number of deaths in the first year of life

N^v is the number of live births

Neonatal mortality rate (NMR)

It is defined as the number of children under 28 days of age who die, divided by the number of live births in that year and multiplied by 1 000 (UNICEF, 2019).

$$NMR = \frac{D_{0-27}}{N^v} * 1000$$

D_{0-27} is the number of deaths of children under 28 days

N^v is the number of live births

Post-neonatal mortality rate (PNMR)

It is defined as the number of children dying between 28 and 364 days of age, divided by the number of live births in that year and multiplied by 1 000 (Pavlík et al., 1986, p. 149).

$$PNMR = \frac{D_{28-364}}{N^v} * 1000$$

D_{28-364} is the number of deaths of children between 28 and 364 days of age

N^v is the number of live births

Direct method of standardization

The standardization is the elimination of influence of age structure, in which we define a particular age structure as a standard and we weight age-specific death rates of the compared populations by this standard (Pavlík et al.,1986, p. 159). We chose the WHO standard population for the year 2001 (see Attachment 2 – WHO World Standard Population 2001) (WHO, 2001).[1]

$$m^{st} = \frac{\sum m_x * P_x^{st}}{\sum P_x^{st}}$$

P_x^{st} is the standard population

m_x is the mortality rate at the age x (Pavlík et al.,1986, p. 159):

[1] Available: https://apps.who.int/healthinfo/statistics/mortality/whodpms/definitions/pop.htm

$$m_x = \frac{D_x}{{}_{1.7}P_x}$$

D_x is the number of deaths by age

${}_{1.7.}P_x$ is the mid-year population at the age x

Life table

The mortality table is used to characterize the extinction of a specific population. Using biometric functions provide an expression of the mortality intensity of the studied population (Pavlík et al., 1986, p. 174). This table serves us to calculate firstly, life expectancy at birth and at the age of 50 and secondly the median age at death for men and women. Life expectancy at the age of 50 was used to remove the effect of mortality in the first year of life and at the same time show increasing life expectancy in older ages, for example, thanks to improving health care.

Life expectancy is defined as "A measure to standardize the mortality rates of one calendar year or several calendar years (i.e., period). Life expectancy shows the average number of years a person of a given age can expect to live, assuming that age-specific mortality rates remain constant for the rest of that person's life. A distinction is made between life expectancy at birth and remaining life expectancy (i.e., the years a person can expect to live at a given age)"(Max Planck Institute for Demographic Research, 2020).

The life table functions are follows (Pavlík et al., 1986, p. 176–200):

q_x is the probability that a person of exact age will die within one year (we used indirect linear method for counting)

For the age 0 the calculation is:

$$q_0 = \frac{D_0}{N^v}$$

D_0 is the number of deaths at the age of 0

N^v is the number of life births

The calculation for other ages is:

$$q_x = \frac{2 * m_x}{2 + m_x}$$

m_x is the mortality rate at the age x

l_x is the number of persons surviving to exact age x

For the age 0 the calculation is:

$$l_0 = 100\,000$$

The calculation for other ages:

$$l_{x+1} = l_x - d_x$$

p_x is the probability for surviving from exact age x to exact age $x+1$

$$p_x = 1 - q_x$$

d_x is the biometric number of deaths between ages x and $x+1$

$$d_x = l_x * q_x$$

L_x is the number of person-years lived between exact ages x and $x+1$

For the age 0 the calculation is

$$L_0 = l_0 - (k * d_0)$$

k is proportion of infants died during the first months after birth. The value 0.92 was used in this thesis as New Zealand´s population is considered as modern population, where usually most of the infants deaths are highly concentrated shortly after birth.

For the last open interval the calculation is:

$$L_{x+} = \frac{d_{x+}}{m_{x+}}$$

m_{x+} is the mortality rate in the last open interval

d_{x+} is the biometric number of deaths in the last open interval

For the other ages the calculation is:

$$L_x = \frac{l_x + l_{x+1}}{2}$$

T_x is the number of persons-years lived after exact age x

For the last open interval the calculation is:

$$T_{x+} = L_{x+}$$

For the other ages the calculation is:

$$\mathrm{T}_x = T_{x+1} + L_x$$

e_x is the average number of years of life remaining at exact age x

$$e_x = \frac{T_x}{l_x}$$

e_{50} is the average number of years of life remaining at exact age of 50

$$e_{50} = \frac{T_{50}}{l_{50}}$$

Median age at death

Based on the life tables, we calculated the median age at death separately for both sexes (Pavlík et al., 1986).

$$\tilde{x} = x + 1 + \frac{0.5 - d_x^{relative\ \ cumulative}}{d_x^{relative\ cumulative} - d_{x+1}^{relative\ cumulative}}$$

$d_x^{relative\ \ cumulative}$ is the relative cumulative biometric number of deaths at the age x

$d_{x+1}^{relative\ cumulative}$ is the relative cumulative biometric number of deaths at the age $x+1$

The calculation of $d_x^{relative\ \ cumulative}$ is:

$$\mathrm{d}_{\mathrm{x}}^{\mathrm{relat.kumul.}} = \frac{\mathrm{d}_{\mathrm{x}}^{\mathrm{cum.}}}{\sum d_x}$$

$d_x^{cum.}$ is the cumulative biometric number of deaths at the age x

$\sum d_x$ is the sum of the biometric number of deaths

3.4 Selected indicators for nuptiality description

To fulfil the objectives of this work, we used basic nuptiality indicators to capture changes that occurred as a result of the selected historical and social events (see Chapter 2.1). As the data is not available to cover all studied periods, we had to focus only on the period between 1998–2018.

Reduced age-specific first marriage rate

We use this to show the distribution of marriages by age groups of the reduced age-specific marriage rate which is defined as the number of marriages per 1 000 women or men of a specific age (Pavlík et al., 1986, p. 253).

$$s_x^r = \frac{S_x^S}{{}_{1.7}P_x}$$

S_x^S is the number of first marriages to women and men of a specific age

${}_{1.7}P_x$ is the mid-year population of women and men of a specific age

Mean age at first marriage

The mean age at first marriage is defined as "the mean age of men or women when they first get married" (Eurostat, 2020). We calculated this indicator for men and women aged from 16 years to 49 years. These ages were selected as until the age of 49, the highest number of first marriages was entered.

$$\bar{x} = \frac{\sum x_c * s_x^r}{\sum s_x^r}$$

x_c is the middle of the age interval

s_x^r are reduced age-specific first marriage rates

3.5 Data sources

The data used for the calculations in this work were taken from the *New Zealand Statistical Office.*[2]

The first statistical attempts to sum up the population of New Zealand appeared in 1842. There had been efforts to sum up the population before, but this available data is only estimated and incomplete, as New Zealand had not yet been fully investigated. The first real national population census was held based on the behest of the British government in 1851, including not only the European population. In order to preserve the consistency of census information, the Census Act was published in 1858, which recommended to do a national European census every three years. This regularity of censuses lasted until 1874. The first census for the Maori population took place in 1857–1858. In 1874, the European and Maori censuses were conducted in the same year. Nevertheless, the information obtained from the first censuses on the Maori population were not as detailed as those of the European population. The 1877 Census Act stipulated that censuses would be held every 5 years commencing in 1891. This regularity has so far been broken four times in 1931, 1941, 1946 and 2011. Due to the economic crisis, the census was abolished in 1931 and the census was also abolished in 1941 as a result of World War II, because a lot of clerks and

[2] Available on: https://www.stats.govt.nz/

other staff who were tasked to the census went out to fight the war. The 2011 census was cancelled due to an earthquake in Christchurch that occurred two weeks before the census. For this reason, the census took place in 2013 (Stat NZ, 2013).

A very important source of data provided by the New Zealand Statistical Office is the *Yearbook collection*, which is available from 1893 to 2012. These yearbooks provide detailed information about New Zealand, not only about its population, but also about the state apparatus, industry, agriculture, and many other areas for each year. However, the available information varies from year to year because it had been continually refined and supplemented by new interesting areas where significant changes had taken place and had had a significant impact on life in New Zealand. In addition to these data sources, data reports or summary reports are available to summarize the overall results for the reporting period. From this source general information about New Zealand (about natural conditions and historical events) was used in this work (Stat NZ, 2020i).

The Statistical Office also operates an online database of data source called *Infoshare*, where data is collected not only on demographic topics (data about deaths, births, marriages, etc.), but also information about economic, business, tourism, industry and many others (Stat NZ, 2020e). In Attachment 2, we summarized data which we used in this thesis to calculate selected indicators (see Attachment 2 – The table of used data).

Chapter 4

Natural Conditions and History of New Zealand

4.1 New Zealand Natural Conditions

Aotearoa, the Maori name for New Zealand, is a country located in the South Pacific. As we can see on the map of the country (see Fig. 1), it consists of two main islands, the North Island and the South Island, and several smaller islands. On the North Island, we find not only the capital of New Zealand, Wellington, which is located in the south, but also the largest New Zealand city, Auckland, that we can find in the north of the island. The largest city on the South Island is Christchurch, which can be found in the eastern part. An important university city is Dunedin, which is located in the south of the island (Corrigan, 2001, p. 12–15).

The area is characterized by frequent earthquakes and is therefore also known as the "ring of fire". Approximately once every one hundred years there is an earthquake of magnitude 8 and earthquakes of magnitudes over 6 occur virtually every year. The reason for these earthquakes is that New Zealand lies on the Pacific plate and the Indo-Australian plate. Another threat is volcanic activity. There are many active volcanoes in New Zealand and the frequency of their eruptions is high. In the past 150 years, far more people have died as a result of volcanic activity than in connection with earthquakes. The volcanic activity that shaped the local landscape is represented by the active volcanoes Ruapehu, Tongariro, and White Island. The climate conditions are mostly influenced by latitude, the oceans and mountain chains, which make the climate extremely varied between the western and eastern parts of the islands. The country is often exposed to strong rains and severe storms that cause considerable damage to property. The highest temperatures occur in the northwest of the country, about 16 degrees. The rainfall is between 600–1 600 millimetres and even snowfall can occur on the South Island, while very rarely on the North Island (Stat NZ, YB 2008).

With a very long period of isolation from the outside world, there were a large number of endemic species in New Zealand. Unfortunately, the arrival of the Polynesians had a huge negative impact on the untouched nature. Because of hunting, many species have been completely exterminated. Due to human activity, there were also very frequent fires, which impacted the forest areas that had covered 75 percent of New Zealand's land before the first people arrived. In

addition, the Polynesians brought their own animals from their homeland, which began to kill the local species, which had not had any natural enemies before. These foreign species began to breed rapidly perpetuating the decline of the native species (Wardle, 1991, p. 7–11). One of those, that unfortunately did not survive was the moa. It was one of the largest flightless birds that had ever lived on the earth. Before the arrival of people, they had not had any natural enemies, however, that changed with the arrival of the Polynesians because the moa began being hunted for its flesh and skin, leading to its gradual eradication (Anderson, 1989, p. 3–7).

Explorers had problems with crops. Many of the crops they brought with them failed in the local terrain and climate conditions. Fortunately, New Zealand was full of other crops that the newcomers learned to grow very quickly. The basic staple vegetable was the kumara, a sweet potato, which was very successful thanks to its simple cultivation technique and adaptability. They succeeded in creating revolutionary methods for storing food, especially with the technique of building underground pits where food was stored for winter baking, or in the spring, when the seeds were used for new cultivation. They dried fish, many kinds of fruits, preserved meat to keep its durability for as long as possible and to protect it until the winter (Smith, 2012, p. 18). Today, New Zealand is heavily dependent on its agricultural industry especially pastoralism, which concerns sheep and cattle, but also raising pigs, poultry and deer. It is also important to grow grapes that have been growing since the 1830s and from which very good quality red and white wines are produced because they are exported to the whole world. New Zealand is today also one of the largest producers of the kiwifruit and also other fruits such as peaches, avocados, nectarines and many more (Corrigan, 2001, p. 34–37).

Figure 1: Map of New Zealand

Source: King and Cole, 2008

4.2 New Zealand History

New Zealand had been waiting for its discovery for a long time. Its history is not as extensive as other countries. We do not know the exact date when the first people entered the mainland. Nevertheless, it is generally accepted that this event occurred during the 13th century. New Zealand´s first inhabitants were the forerunners of today´s Maori (Stat NZ, YB 2008).

The ancestors of contemporary Maori populations had been living on the islands of western Pacific for thousands of years before they came from the Asian dry land. They lived by farming, especially breeding and raising pigs and fowls and they also excelled as proficient fishermen and skilful shipbuilders. About 1500 BC, a big boom of exploratory voyages began. These voyages were mainly taken eastwards for long distances to islands that had not been inhabited by humans yet. The first stop was Fiji and around 1000 BC, the discoverers arrived in Tonga and Samoa and settled also on other nearby islands and stayed for about 1000 years. Today we call this area Western Polynesia. About 2000 years ago, an expedition sailed from Samoa that headed for islands located in the east (Orbell, 1985, p. 5).

According to tradition, the discoverer of New Zealand is known as the sailor Kupe, who came there from today's Hawaii on the canoe Matawhaorua together with his wife Kuramārotini. During his discovery voyage, a great deal of adventure awaited him, such as fighting a giant squid and a whale (Land Information New Zealand, 2018).

Adapting to new living conditions was not so easy for newcomers. Much of the food they brought with them could not be cultivated, so they had to get acquainted with local crops and animals. However, over time, the Maori adapted to the new conditions. They started growing sweet potatoes (kumara), hunting, fishing and catching birds (Stat NZ, YB 2004). Most of the houses were built on the eastern side of the South Island, as there were a warmer climate and a greater number of moa and seals. At the beginning of the 15th century, however, the climate change began and much better living conditions for settlers began to appear on the Northern Island. At that time, the North Island was mainly dependent on horticulture, even though subtropical crops, like kumara and sweet potatoes, grew here with difficulty. But due to new cultivation and storage practices, many crops could be grown in other places where cultivation had been slightly modified. A growing number of inhabitants was a very important factor in the development of horticulture and increased production (Orbell, 1985, p. 7–11).

Based on skeletal remains and a lot of other evidence, we know now that the descendants of the first Maori were relatively tall, men were about 170 cm, but women were noticeably smaller. The life expectancy was only about 35 years. Women gave birth to an average of 4 children, more only in exceptional cases. Their food was quite varied, yet they suffered from gum disease, which was caused mainly by soft food. The discoverers did not bring any viruses and bacteria causing measles, rubella, varicella, scarlet fever, mumps or gonorrhoea. They were not even carriers of more serious diseases such as tuberculosis, smallpox and syphilis. Based on skeleton studies, it was an infection caused by spoiled teeth and pneumonia (Sinclair, 1997, p. 13–14).

The exact date of the discovery of New Zealand by Europeans was a controversial topic for quite a long period. Earlier historians, especially during the 18th century, attributed its discovery

to the French or the Spaniards. These historians were based primarily on traveller's diaries. Binot Paulmier de Gonneville went on a voyage to East India in 1503. However, during a thunderstorm, he was forced to change the direction of his journey and reached unchartered waters. He discovered the mainland he called South India and he spent 6 months there. During his time on the new island, he continued writing his diary in which he described the island and the way the inhabitants lived. After his return to France, he recorded the date of his discovery on July 19th, 1505. Later it was proved that he did not arrive in New Zealand, but in Australia (Stokes, 1970, p. 3–5).

Abel Tasman, a Dutchman, generally remains the first recognized European to enter New Zealand. His discovery cruise began on August 14th, 1642, when his two ships Heemskerck and Zeehaen set sail from Batavia. During his journey, he discovered Tasmania, which was named after him. During a sea voyage, Tasman saw the land on December 13th, 1642. After his encirclement, he reached the bay on December 18th, now called Golden Bay. Unfortunately, there was a clash between his men and the inhabitants of the island during which some of his men were killed. Therefore, Tasman decided to sail and called this bay Murdered Bay. Despite this unfortunate conflict, he notes in his diary that this country had captivated him and considered it as a beautiful land (Wilson, 2005a).

The real interest in New Zealand was manifested by England in the second half of the 18th century when John Byron cruised in 1764–1766. This was mainly due to the growing competition and rivalry between the world powers, including Spain, the Netherlands and France (Ministry for Culture and Heritage, 2019). Apparently, the most important European who had managed to reach New Zealand´s shore was captain James Cook. He commanded the ship Endeavour, which sailed from Plymouth port on August 26th, 1768, and arrived at Tahiti Island almost 8 months later, on April 13th, 1769. On August 9th of that year, Cook started sailing south to explore the south-facing islands. Finally, on October 6th, he succeeded in reaching the same point as Abel Tasman. This point was New Zealand. Cook´s first encounter with Maori was not successful either. After landing the ship, one sailor was killed during a misunderstanding, and the next day more were injured and killed (Mackay, 1990).

Despite the incident, Cook managed to trust the island´s inhabitants, the Maori, who allowed him to stay on the island and map it. He wanted to get this country for the king of England, George III. His first stay lasted for 6 months and during this time Cook conducted an extensive exploration of the island and managed to gain detailed knowledge of the local fauna and flora. Then he returned to the island in 1773 and 1777. New Zealand came to the forefront of European hearts. A partnership, which was based on the exchange of goods, began to form between England and the Maori. By the 1830s, Maoris accepted several groups of Europeans and with each group, another kind of pressure was brought to the Maori society. From the 1890s they were whalers and merchants, and since 1814 missionaries. In 1839 there were 2000 permanent settlers there. They mostly settled where they could build ports, like on riverbanks and seashores. Thousands of those who settled in New Zealand did so for a temporary period (Sinclair, 1997, p. 28–30).

From 1814, British missionaries were coming to the newly populated country to convert the Maori population into Christian believers and teach them a new way of life. The Maori gradually

took new habits. New schools were founded and the literacy of the population increased. The English brought with them new crops, ways of cultivating land or building techniques. However, the increasing influx of new settlers also brought a number of negatives. New diseases had also been imported to New Zealand, which the indigenous people did not know and were not immune to. At that time there was a high mortality rate among the Maori population for measles and influenza. There were still armed conflicts between newcomers and Maori, as well as disputes between tribes who wanted to get the best out of the Europeans for themselves (Archives New Zealand, 2020).

On February 1840, one of New Zealand´s most important documents, the Treaty of Waitangi, was signed. It is an agreement between Great Britain and more than 500 Maori chiefs. The agreement was drafted in two languages, both versions differed significantly. The English language version was signed by only 39 chiefs, the rest signed in the Maori language. The treaty was to guarantee Maori´s chiefs to maintain their status, ownership of their land, and the management of natural resources. At the same time, the Maori were promised that the rights and privileges acquired by Europeans would extend to them. Great Britain´s main goal was to make New Zealand its dependent colony, which it could fully control. There was also fear of other colonial powers of that time, as New Zealand provided not only very favourable living conditions but also considerable mineral wealth. As a result of the signing, New Zealand became a colony of Great Britain (State Service Commission, 2013, p. 3–18).

The subsequent second half of the 19th century was marked by the effects of the signing the Treaty of Waitangi. The period between 1845–1872 was a period of protracted wars, referred to as "Land Wars" or "Maori Wars". At this time, the Maori chiefs began to realize that the document they had signed in their native language did not correspond fully with the English version. Initially, the British adhered to the agreement, as they needed to integrate the newcomers among the Maori, from which they needed to acquire land, food and raw materials for their settlers. As a result of these riots, the British government started to seize Maori´s own land. Although the Maori rebelled against land grabbing, nothing changed (Sinclair, 1997, p. 52–71).

The period between 1891–1912 was the beginning of modern New Zealand and is called "The liberal era". During this period, the local political parties started to play a major role and we can observe the stabilization and democratization of New Zealand´s society. There was an introduction of the general electoral right of adults, including women, much earlier than in the United States and Great Britain. New Zealanders were rightly proud of it, and their sense of pride became an important part of their national identity. Even though women were given the right to vote, they still could not become members of the government (Sinclair, 1997, p. 112–130). However, some countries only admitted women the right to vote during the 20st century. As we can see in Table 1, after New Zealand, it was Finland, in 1906, which became the first country in Europe to permit this right. Although women in Canada won the voting right in 1917, but this one only applied to women who had lost their husband in the war or had a husband or a son in the war (Pariona, 2019).

Table 1: The year of the Right to Vote for Women in Selected Countries

Year	Country
1893	New Zealand
1906	Finland
1917	Russia
1918	Germany
1928	United Kingdom
1944	France
1953	China
1956	Egypt
1971	Switzerland
2015	Saudi Arabia

Source: Pariona, 2019

One of the main events in New Zealand's history was the participation in the First World War between 1914–1918. The turn of the 19th and 20th centuries in Europe was represented by the very rapid development of industry, resulting in increased competition between European powers. The biggest problem was the rivalry between Great Britain and Germany, who competed among themselves for colonies and the division of their influence in Europe (Novák, 2002, p. 7). The tension between the states began much earlier than the decisive event that finally triggered the First World War. On June 28th, 1914, the Austrian Archduke Franz Ferdinand was assassinated by Gavriel Pricipe in Sarajevo (Hastings, 2014, p. 15).

This event was the culmination of disputes between the states of Europe at that time. The following day, the Russian army was mobilized and thus threatened the Austro-Hungarian Empire. Therefore, Germany's ally threatened Russian with war if it did not stop the mobilization of the army. France, worried about a possible outbreak of war, began to mobilize as well. Russia and Germany were unable to agree, and so on August 1st, 1914, Germany declared war on Russia. France did the same two days later, on August 3rd. For the time being, there were no indications that the United Kingdom felt threatened. This changed once Germany invaded Belgium, according to the Schiffens plan and so became a threat to Great Britain, which declared consequently war against Germany on August 4th (Gilbert, 2014, p. 27–43).

Because New Zealand was part of the British Empire, its residents were involved in the war. Another reason was that New Zealand was economically dependent on Great Britain. It was mainly concerned with the frozen meat market, milkshakes, and other products. More than 100 000 inhabitants were involved in the war, and even those who could not (women, children,

the elderly) tried to support their soldiers economically and materially. First, the New Zealand garrison was tasked with regaining Samoa, where the Germans had built a lossless station (Ministry for Culture and Heritage, 2016).

New Zealand's troops accomplished this task with no trouble. Subsequently, around 8 000 men were sent on another mission to Egypt, where they, together with Australian troops, arrived in Gallipoli on April 15th, 1915. The Battle of Gallipoli is also known as operation Dardanelles, and its main goal was to dominate the Dardanelle's flow. New Zealand troops, however, also participated in fighting on the Western Front, where the loss of life was much higher. During the Battle of the Somme (September 1916), they fought successfully alongside the Allies, but their loss in units was around 80 percent. New Zealand showed tremendous loyalty to the British Empire during the First World War (Smith, 2012 p. 130–134). Despite the considerable loss of life (according to official data from Stat NZ more than 16 000 people died during the war from about 100 000 soldiers who took part in the war), rightly so, New Zealanders are proud of their soldiers who fought in the war (Stat NZ, YB 2008).

The inhabitants were not yet able to recover from the First World War and had to face another disaster. An influenza pandemic affected New Zealand during the 20th century, all three waves (in 1918, 1957 and 1968). The highest impact on the population was in 1918. Influenza is a life-threatening disease, as it spreads rapidly and can cause serious life-threatening complications. The epidemic occurred, most notably, during the winter months. People of all ages were affected but mortality has declined since the 1960s (Ministry of Health, 2017, p. 16–17).

The period after World War II was in the spirit of rebuilding the economy. It was especially heavily burdened with finding benefits for soldiers and their families. A big problem in New Zealand was the housing situation, which was mainly affected by large cities (especially Auckland and Wellington). People were forced to live in overcrowded flats, as the prices of land in the post-war period flew upwards, and people could not afford to live alone. Evene if the salaries improved, the prices of food, rent, and other commodities remained very high. Moreover, the reintegration of soldiers was not ideal. The government tried to put them back into work, but it did not always succeed and soldiers were assigned activities that they were not qualified for, which often led to financial problems. When the New Zealand economy began to slowly recover, the world economic crisis hit the world. Food prices fell steeply, which affected farmers considerably and unemployment increased in cities. After its end in the 1930s and the economic situation started to improve, another conflict took place in Europe, the Second World War (McKinnon, 2015, p. 2–9).

World War II, which ran from 1939 to 1945, with more than 60 million casualties, has been so far the largest war conflict that human history has remembered. The war officially broke out on September 1st, 1939, the day, when Nazi Germany attacked Poland. Subsequently, Great Britain (and other members of the Commonwealth) and France declared war on Germany, hence, New Zealand was also involved in the conflict. The main reasons for the conflict were, in particular, the discontent of Germany with the Versailles Treaty and the rise of nationalism. For Germany, the defeat in World War I was a great humiliation. Movements such as Nazism in

Germany, Fascism in Italy and Communism in the former Soviet Union were expanding (Grečko, 1978, p. 15–33).

New Zealand sent tens of thousands of men to war to support the United Kingdom and their Allies. However, it proved to be a difficult task for internal politics in New Zealand. It was very important for the inhabitants to be involved in the war in all possible ways, but the government did not want the population to be affected again by the war than absolutely necessary. Therefore, many measures were introduced as a consequence of the mistakes made by the government during the First World War. Food prices were kept low so that all residents could afford to buy sufficient amounts of food. The domestic industry was also developing because the war was also fought at sea, resulting in the restriction on the import and export of various commodities. Also, there was a tremendous involvement of women in the war, though not in the fighting. Women began to replace men in many professions (farmers, truck drivers) (Sinclair, 1997, p. 190).

As the situation for the Allies did not develop favourably in 1942 and more and more troops were needed in the same year, the biggest mobilization took place in New Zealand, calling for tens of thousands more men and even the local population to be involved in helping to fight against the enemy. In addition, people were afraid that New Zealand would be attacked directly from Japan, which fortunately did not happen. After a heavy six-year fight, the surrender of Germany (May 8th) and Japan (August 15th) in 1945 was finally completed with huge losses (Ministry for Culture and Heritage, 2017).

After the country recovered from the war, there was a period of prosperity, a functioning economy, industry, and agriculture that has continued to the present days. Even in the second half of the 20th century, New Zealand continued to maintain very strong ties with Great Britain, with which it actively traded and from which most immigrants flowed into the country. The economy was deeply affected by the crisis since the end of World War II only twice, in 1973 and 1978, when the oil shock occurred. The government tried to mitigate their impact by introducing agricultural subsidies and by creating new industrial projects, but it failed to save the situation and during these periods there was high unemployment and inflation. At the turn of the 20th and 21st centuries, there was a spirit of political changes, which concerned, in particular, the opening of the trade market and the creation of a new voting system (Wilson, 2005b).

Nowadays, New Zealand is a constitutional monarchy. The head of the state is Queen Elizabeth II. Not only being the common head of state but also because of their common history and values, both countries, New Zealand and Great Britain, maintain a strong relationship with each other, accompanied by frequent visits of British Royal Family members. The two countries are also linked by strong economic, agriculture and investment ties and are members of multinational communities and institutions (Ministry of Foreign Affairs and Trade, 2020). New Zealand is very economically successful. In particular, the migration boom of recent years and the support of monetary policy have made a great contribution. As a result, the economy is doing very well and thus inflation is low, as is the external deficit (OECD, 2017, p. 14–18). This is also reflected in the quality of life. Between OECD countries, the Better Life Index is higher in New Zealand than the average value. This index is calculated by OECD and allows us to compare satisfaction across eleven different areas of human life in the country and also to compare these

values with other countries. The examined topics include, for example, health, education, housing, jobs, and many others. Living conditions in New Zealand are extremely high and it is no wonder that it regularly falls into the top 10 best countries for living standards, in the world (OECD, 2020).

A key demographic trend at the turn of the 20th and 21st century in New Zealand, as well as all around the world, became population ageing. Improvements in health care and new medical breakthroughs reduced mortality and increased life expectancy. On the other hand, fertility decreased significantly, mainly due to the increasing emancipation of women, when they started having the same educational and working abilities as men, and therefore the children either postpone childbirth until an older age or they do not want children at all and prefer to focus on their careers. The high increase of people in retirement age in New Zealand is also related to the generation of "baby boomers" who are gradually moving into it (Li, 2013, p. 312–313).

The baby boom was not only a matter for New Zealand, but it affected a number of western developed countries too, especially in the mid-twentieth century. It was characterized by an increase in fertility. However, this increase was not expected at all. The exact causes of this baby boom are still unclear to this day. The first conclusions from the research perceived it as a natural replacement for World War II loss. Nevertheless, perceiving this baby boom only as a result of the war is not possible, as it has its origin in the 1930s and 1940s (Sánchez-Barricarte, 2018, p. 1190).

On the other hand, Doepke et al. (2007) hold the opinion, that it was exclusively related to World War II and put it in the context of women involved in the labour market during wartime. They applied their theory to the example of the United States. When the men went to fight, someone had to replace them in the factories, because the economy needed to function during this period. The involvement of women led to their increased emancipation and after the war, many wanted to continue to work and increase their education and qualifications. It was certainly expected that this emancipation would have opposite effects and reduce fertility, as women who want to work more and educate themselves will have less time to take care of their children, so they decided to have less of them (Doepke et al., 2007, p. 1–3).

When the men returned from the war, a number of women, who were employed in the labour market decided to stay in it. Young girls who ended school were in a position to decide, whether they would like to join the labour market, which was very competitive during this women's emancipation movement, or, whether they would prefer to get married and start a family. Because of the overcrowded labour market, many girls had to choose marriage and to have children, as it was confirmed by the fact that these young girls had the highest fertility during the baby boom, especially the 20–24 age group (Doepke et al., 2007, p. 1–3).

The direct consequence of the social changes occurring during World War II was a change in New Zealand's family morphology. As mentioned in the previous paragraph, after the war, women got married younger and left paid work. However, during the 1960s and 1970s the women's way of life changed radically, also because of the feminist's movement. As a result, women gained new rights and started to focus on their careers. They became particularly active in political organizations and the key topics of that time such as abortion rights, political,

educational and employment opportunities for women, etc. Also, we can observe during this period a new approach to regulate fertility using means such as the pill, which became easily accessible (Pool and Du Plessis, 2011).

The generation of "baby boomers" is now beginning to move into retirement age, and it is going to put a considerable demand on social policy. Higher demands will be placed on health care and the pension system. That is why the government is trying to come up with a solution to keep the population as healthy as possible. Preventive programs are underway to target the elderly and to raise people´s awareness of the causes of serious illnesses. The programs focus mainly on the prevention of obesity and related regular exercise, healthy eating, which is associated with high blood pressure, mental activities that help maintain an active brain and prevent its degeneration. An important question is also how pension payments will be resolved. In many countries that are already facing an ageing population, the retirement age is shifting. Governments are also trying to motivate people to work longer and retire later, in the form of more flexible jobs, which can be largely carried out from home, or promise financial benefits (Ministry of Health, 2016 p. 6–7).

Despite all these efforts, it is clear that the health system will be heavily burdened in the near future. As many as 1/3 of people aged 85 and more need constant medical supervision and must therefore be placed in special facilities. It means that far more staff (doctors, nurses and other assistants) will be required. Great effort is to be made to try and involve family members in the care of their old relatives. Unfortunately, this option has little chance of success. While in the past daughters and grand-daughters took care of elderly relatives, whereas the increase of involvement of women in the workforce has led to this tradition becoming less widespread and less likely that women will forfeit their job. Not only because of economic reasons, but also because working with the elderly is very stressful and physically and mentally demanding (Te Pou, 2011, p. 1–4).

4.3 Summary

New Zealand became known to the Europeans in the 17th century thanks to the Dutch sailor Abel Tasman and during the 18th century, it was colonized by Great Britain (Wilson, 2005a). As a British colony, New Zealand had to adopt English legacy and their way of living, which caused conflicts with the indigenous population. In 1840, the Treaty of Waitangi, an agreement between Great Britain and Maori chiefs was signed. However, the aim of Great Britain was to mould New Zealand into a fully controlled colony. The 19th century was the liberal era when the local political parties started to play a major role within the country (Sinclair, 1997, p. 40–71).

Regarding the 20th and 21st century, we identified the following events playing a key role in the history of New Zealand and its population development. The first one was the First World War that New Zealand had to join due to being part of the Commonwealth (Ministry for Culture and Heritage, 2017). The second event that significantly influenced their history was World War II. All inhabitants were involved in the war in all possible ways, particularly we saw a huge involvement of women. They began to replace men in many professions (farmers, truck drivers)

and this fact could explain the social changes that occurred after the war and also during the 1960s and 1970s (Sinclair, 1997, p. 190).

The ethnic and religious structure of New Zealand is very closely linked to events during the 18th and 19th centuries. The English gradually began to dominate numerically compared to the original inhabitants, the Maori. Their traditional religion gradually began to recede and Christianity prevailed (see Chapter 5.3). The current population development is very closely related to the events that occurred during the 20th century and its impacts are beginning to manifest. Whether it is the baby boom generation that will severely burden the pension system, or the increased women´s emancipation after World War II, which led to an increase in the education of women and their participation in the labour marker, but at the same time it contributed to reducing fertility and postponing the birth of children into older age. It is therefore important for the following chapters to know these key historical events.

Chapter 5

Characteristics of New Zealand population

Even though the population of New Zealand is small on a global scale (in 2018 there were almost 5 million inhabitants) (Stat NZ, 2020c), its population is very interesting as it is influenced by a large variety of factors, which influence its age, ethnic, religious and also the educational structure even today. The first half of the 20th century was marked by a demographic transition, two world wars, the world economic crisis and in the second half of the century there was a huge baby boom and economic development (Pool and Jackson, 2011).

All these events were reflected in demographic processes (mortality, fertility, nuptiality) and are reflected in the age and ethnic composition of the population. The aim of this chapter is to give the basic characteristics of New Zealand's population based on age, ethnic, religious and the educational structure for the period between 1991–2018.

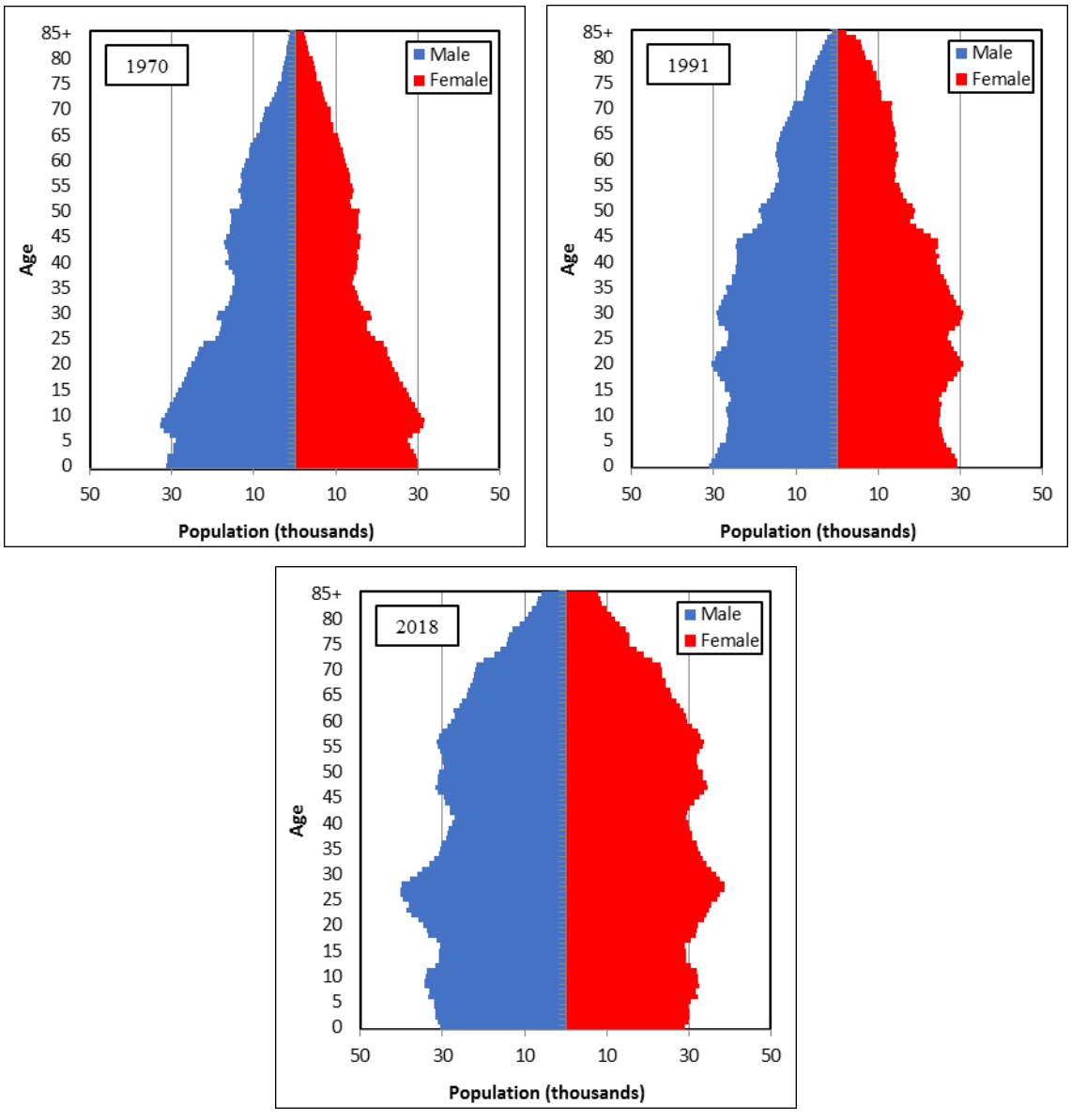
5.1 Development of age structure

Around the period 1890 to 1980, New Zealand experienced a demographic transition. It is characterized by a decrease in fertility and mortality and growth in life expectancy. The manifestation of these trends is the subsequent ageing of the population (Badkar, Callister and Didham, 2009, p. 5). The fact that people live longer refers to an improvement in living conditions and health care and demonstrates that the quality of life in New Zealand is high. The increasing number of seniors refer to the baby boom era, when people born between 1945–1965 began to reach the age of 65 in 2011 (Gordon, 2014, p. 12–13).

Age pyramids describe age structure and its changes (see Fig. 2). In the pyramid which represents the year 1970, when the baby boom was at its peak, we can see that New Zealand's population was young. The highest value of total fertility rate was in 1961, when it reached 4.3, then it gradually decreased, but in 1970 it was still over 3, while before the war, the value of this indicator was around 2.5 (Stat NZ, 2020ch). However, we can call this pyramid a progressive type. The pyramid for the year 1991 shows a strong representation of baby boomers at the age between 18–35. After the baby boom was finished in the late 1970s, the number of births began

to decline and the pyramid bases began to narrow (Stat NZ, 2017). This is seen very well in the pyramid which represents the year 2018, where we can observe a significantly lower number of people around the age of 40 in both sexes, which is due to a reduction in the number of births, when during the second half of the 1970s the total fertility rate dropped below the pre-war value. In the course of the 1980s, its value even fell below the level of reproduction, i.e. below 2.1 In contrary, baby boomers from the post-war period began its course to an ever-increasing age, and so in the following years, the post-reproductive component may begin to outweigh the child component and changes the type of pyramid to regressive, as seen in the age pyramid for the year 2018 (see Fig. 2).

Figure 2: Age pyramids, New Zealand, 1970, 1991 and 2018

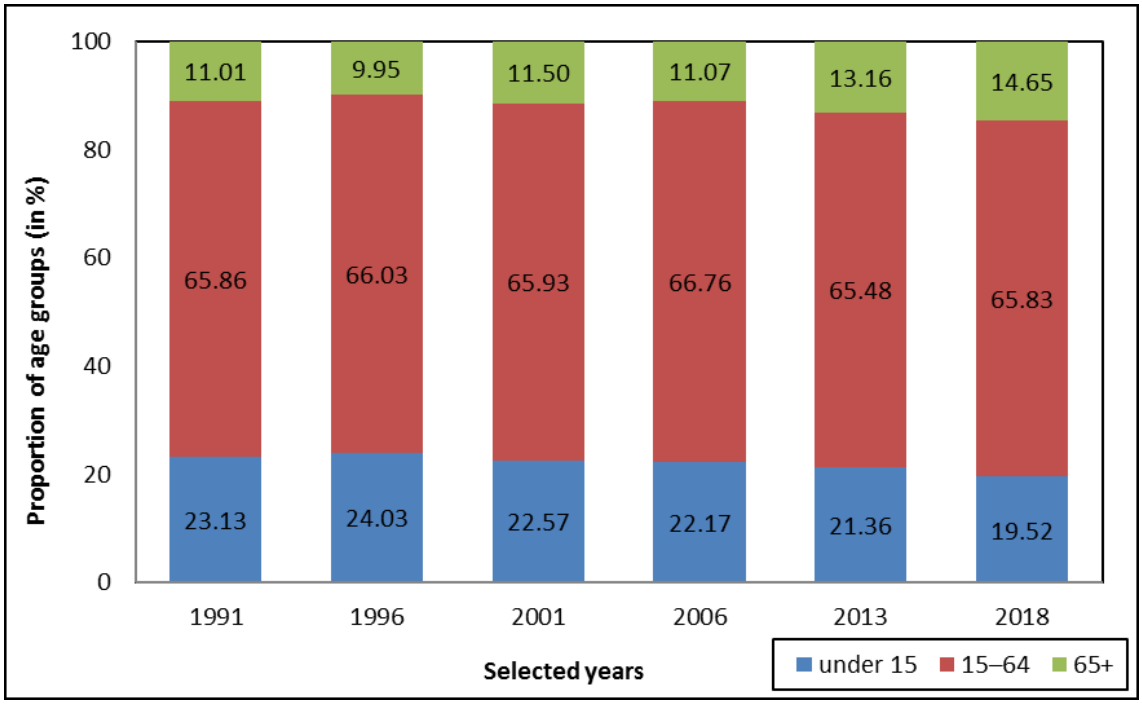


Source: Stat NZ, 1970– 2018, author´s adjustment

Based on Fig. 3, we can better illustrate the fact that the post-productive component is beginning to increase to the detriment of the child component. In Fig. 3, we can see, for the selected years, that the post-productive component follows a growing trend, while the child

component has fallen. From this graph we can see how the share of people aged 65 and over has increased by 3 percent points to 14.65 since 1991. Because the "baby boomer" generation is gradually moving towards this age, it can be expected that this proportion will grow faster in the coming years. On the other hand, with decreasing fertility, the proportion of the child component in the population is getting lower as well and it is expected that in the following years the post-productive component will reach a higher proportion in the population than the child one (see Fig. 3).

Figure 3: Age structure, New Zealand, selected years in the period 1991–2018, in %



Source: Stat NZ, Census 1991–2018, author´s adjustment

As we can see in Table 2, the ageing of the population is significantly reflected in the mean age, which is rising and, in 2018, it was over 38. The aged-child ratio significantly increased from the 1990s, rising from 105 in 1991, to 172 in 2018. During the studied period, we can observe that the value of young-age dependency ratio dropped from 35.1 in 1991 to 29.5 in 2018. This value is calculated per 100 people aged 15–64 years. On the other hand, the value of old-age dependency ratio increased in the period from 16.7 in 1991 to 22.2 in 2018. This value is calculated per 100 people aged 15–64 years (see Table 2).

Table 2: Mean age, aged-child ratio, young-age dependency and old-age dependency ratios, New Zealand, selected years in the period 1991–2018, in %

	Mean age	Aged-child ratio	Young-age dependency ratio	Old-age dependency ratio
1991	33.9	104.6	35.1	16.7
1996	33.7	98.1	36.4	15.1
2001	35.6	129.8	34.2	17.4
2006	36.4	135.2	31.7	17.8
2013	37.7	159.2	31.1	20.9
2018	38.3	172.2	29.5	22.2

Source: Stat NZ, 1991–2018, author´s calculation

Population ageing is a key issue in New Zealand, as it requires ensuring that the seniors need adequate care. Ensuring such a care is a major problem in many countries, as care for older people is not adequately paid and does not require high qualifications, so young people are not motivated to pursue their careers in this direction. In addition, professions related to senior care are gender biased. In this professional career, we meet women nurses far more than men. The reason for this is that in the past, women were not allowed to do many jobs and educational opportunities were also very limited. For them, the care of older people became socially acceptable, and it has been attributed to them until now. New Zealand will need to increase the number of people who take care of seniors to the extent of more than double over the next 20 years. However, this increase is unlikely, and therefore the government is developing programs to support families and close relatives who can take care of the older members of their families themselves (Badkar, 2009, p. 5–7).

5.2 Development of ethnic structure

The ethnic composition of New Zealand has its roots in history. An important milestone was colonization which started in the late 17th century, but continued especially from the UK since the 18th century, which resulted in a change in values and the fact that the society changed into a European type and adopted a number of British traditions. As more and more new European citizens flowed to New Zealand, the original Maori inhabitants began to be displaced. While the number of Europeans was increasing, the number of the Maori population was declining, and at the end of the 19th century, the Pakeha ethnic group became dominant in New Zealand (Cormak and Robson, 2010, p. 7). In 1900, Maori represented only about 5 percent of the population, while Europeans accounted for 95 percent (Stat NZ, YB 1900).

Globalization and migration, especially during the second half of the 20th century, led to an increase in the total population and to its heterogeneity. In addition to the two dominant ethnic groups, the number of other ethnic groups has grown, and New Zealand became a multicultural country. Another phenomenon that has come to the forefront in the last 25 years is multiple ethnicity, which means that the respondent professes to be part of more than one ethnic group

(Walker, 2001, p. 3–7). Thus, the question of ethnicity first appeared in population censuses in 1986 (Cormack and Robson, 2010, p. 5).

According to ethnicity, the population is divided into 5 large groups (see Table 3) (Stat NZ, 2014a):

1. European (New Zealand European, English, Dutch and many others nations)
2. Maori
3. Asian (Chinese, Indian, Korean,…)
4. Pacific Peoples (Samoan, Cook Islands Maori, Tongan,…)
5. Middle Eastern/Latin American/African (Arab, Iranian/Persian, Iraqi,…)

The European group has occupied a dominant position in New Zealand since the late 19th century, however, there was a significant decrease in this group in the reporting period from 75.59 percent in 1991 to 67.56 percent in 2018. The most numerous subgroup is the New Zealand Europeans, which account over 90 percent of the group. The second largest group is Maori which represented almost 16 percent. Asian community members began to increase in the 1980s as a consequence of increased labour migration because of the changes in New Zealand´s immigration policy. This group includes residents of China, Indonesia, Japan, Central Asia, the Asian part of Russia, as well as many others. This ethnic group has seen a sharp increase over the last 20 years and in 2018 it represented 14.50 percent (see Table 3) (Yong, 2018, p. 1–5). The most numerous Asian subgroups in New Zealand are Chinese, Indians and Filipino. The fourth group is the Pacific population, which accounts 7.82 percent. The most numerous subgroups are Samoan, Tongan and Cook Islands Maori (Stat NZ, 2014a). Members of this group are most concentrated in the vicinity of large cities, especially in Auckland (NZ Government, 2018, p. 6–7).

The last group is Middle Eastern/Latin American/African, whose members make up only 1.44 percent of the population in 2018 and are also mainly in the areas around Auckland, Wellington and Canterbury (Stat NZ, 2014a).

Table 3: Proportion of ethnic groups, New Zealand, selected years in the period 1991–2018, in %

Ethnic groups	1991	1996	2001	2006	2013	2018
European	75.59	68.97	73.32	62.00	66.41	67.56
Maori	12.37	13.91	13.44	13.43	13.39	15.89
Pacific Peoples	4.35	4.60	5.92	6.32	6.62	7.82
Asian	2.68	4.27	6.08	8.42	10.55	14.50
Middle Eastern/Latin American/African	0.17	0.37	0.61	0.83	1.05	1.44

Source: Stat NZ, 1991–2018, author´s calculation

5.3 Development of religious structure

Faith has played a very important role in New Zealand for centuries, as it has mediated the link between what happens after death. The original inhabitants, the Maori, had their gods to protect

them from natural disasters and to whom they sacrificed to. But with the arrival of the first settlers from Great Britain, Christianity became the central religion. This still remains the most numerous, but since the 1970s the attitude of the population towards religion has changed radically. Spiritual religions have come to the forefront, and there has also been a significant increase in the number of those who have not fully subscribed to any religion. Even though the number of believers is decreasing year by year, religion still plays a key role in New Zealand's society, as it remains part of a number of cultural traditions, such as singing to God in anthems to protect the country and prayer before parliament openings (Vaccarino, Kavan and Gendall, 2011, p. 85–86).

In New Zealand, we can encounter a great variety in the beliefs that the local population have, while religious diversity has a growing trend in the context of migration from Asia, Africa and the Middle East. However, New Zealand is a very tolerant country in terms of religion (Human Rights Commission 2009, p. 2). Based on The Universal Declaration of Human Rights, Article 18, "Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance" (United Nations, 2015, p. 47).

The most represented religions are Christianity, Hindu, Buddhism and Islam. Christianity still holds a dominant position, but the number of people who subscribed to it in the 2018 census reduced significantly compared to the 1991 census (see Table 4). In the 1991 census, 60.50 percent points of respondents subscribed to one of Christianity's form (e. g. Adventist, Evangelical, Orthodox or Protestant), but in the following censuses we can see a gradual decrease to 35.58 percent in 2018. This means that the number of people claiming to belong to one of the Christian forms of religion has fallen by 25 percentage points in the period under review. However, many more respondents enrolled in the 2018 census without religion. For the first time in history, there are more people in this group than in the Christian category. The fact that the number of those who did not apply for any of the offered form of religions in the census has increased is explained not only by the decreasing number by believers year by year, but one of the explanations is the fact that many people have switched to Spiritualism and other New Age forms of Religion. New Zealand opened much more to the West during the second half of the 20th century and new religious belief started flowing into the country (McCrindle, 2018, p. 11).

In 1991, 32.30 percent of respondents were in the "no religion" category, while in 2018 it was 46.35 percent. The loss of believers may also be related to the rise of educational attainment. People with higher education more often have the opinion that a scientific and rational approach to life and its explanation is more feasible. Also, much less regard religion as something that helps their mental health and is the way to happiness (McCrindle, 2018, p.11–20).

Table 4: Religious structure, New Zealand, selected years in the period 1991–2018, in %

Religions	1991	1996	2001	2006	2013	2018
Christian	60.50	50.11	52.19	48.17	41.57	35.58
Maori Christian	1.35	0.97	1.62	1.56	1.18	1.28
Buddhist	0.36	0.75	1.06	1.24	1.31	1.08
Hindu	0.05	0.67	1.02	1.53	2.01	2.53
Islam	0.17	0.36	0.60	0.86	1.03	1.26
Judaism	0.09	0.13	0.17	0.16	0.15	0.11
Spiritualism and New Age Religions	0.49	0.47	0.41	0.47	0.41	0.40
Other Religions	4.68	7.28	0.48	0.58	0.77	0.23
No religion	32.30	39.27	26.25	30.82	36.57	46.35

Source: Stat NZ, Census 1991–2018, author´s calculation

Even though the number of believers has been declining in recent years, many people are very open to other religious variants, especially different variants of spirituality and metaphysical things. They feel that these unconventional ways of believing help them in their general well-being and have a positive impact on their mental health. Younger people identify themselves with these modern forms of faith, while the elderly tend to adhere to traditional religions and idealisms (McCrindle, 2018, p. 11).

5.4 Development of education structure

While New Zealand today has one of the world´s highest quality educational system, it was not even a century ago, when reading and writing skills were key to the population. The system of education in New Zealand began to develop fully after 1935, when the Labour Party became the leaders of the country. In 1874, 68.15 percent of the population had the ability to write and read while in 1916, 83.53 percent of the population had these abilities. Due to this fact, the need to build new schools to provide higher levels of education increased. There was an increase in the number of public schools and, through various acts, the government sought to make not only basic but higher education available for all people, regardless of their social status. For example, in 1936, education at post-primary schools for children under the age of 19 became free (McLaren, 1974, p. 5).

Currently, the educational system is very modern and is pervaded by the newest technology and international treaties and agreements were made to make it easier for students to educate across borders and become highly qualified professionals in their fields. Thanks to these possibilities, the population is very well educated, which is reflected in the country´s maturity, very good living conditions, low unemployment and a very prosperous economy (Stat NZ, 2014b).

Ethnic diversity, religious variability as well as government efforts to give high-quality education to everyone, regardless of their circumstances and their financial possibilities, are very strongly reflected in the educational system. In spite of all these efforts, members of some ethnic

groups (especially the Maori and the Pacific), along with the affected individuals and individuals from lower income families, are at a low level of education. In order to increase young people´s interest in education, it is important to create a friendly environment that can lead the individuals to increase their activity and interest in learning (NZ Government, 2019).

In the last few years, educational support programs have been focusing on preventing bullying, which has proven to be successful, as its incidence rates are declining and student's satisfaction with schools is increasing, as well as the feeling of security. In New Zealand, they begin to assert education as soon as a child starts learning to speed up its development of their skills and to become more self-conscious in the future with their knowledge. This type of education, known as Early Child Education, is not compulsory, but more than 96 percent of children attend one of these institutions. The second level is primary and secondary education, which concern children aged between 5–19. For citizens of New Zealand and those who have their permanent residency, there is no cost to study at public schools. New Zealand has many universities of which a total of eight represent the highest grade (NZ Government, 2019).

Since 1991, New Zealand has had a ten-level educational system. The first is a primary education that lasts 8 years. This is followed by junior secondary education, which includes 9 and 10 years of study. These two levels are completed at the age of 16 and are mandatory by law. The following degrees of education are thus voluntary. Graduates of these two levels have only basic education and are referred to collectively as having no qualifications (NUFFIC, 2015, p. 5–15).

There are 4 levels of certificates that differ from each other according to skills and knowledge. A holder of certificate level 1 has basic knowledge for work, is able to solve simple numerical operations and problems. A Level 2 Certificate provides basic information and skills to work or study a particular field. By obtaining Certificate 3, the individual is able to apply the basic knowledge to solve specific simple problems. Level 4 Certificate, the knowledge and abilities of the individual in the area are expanded. Level 5 and 6 are equivalent to the Czech Higher Vocational Schools, and graduates have a basic knowledge of the subject and the school is finished with graduation exams. Tertiary degrees are very similar as in the Czech Republic. It is based on a bachelor´s degree, a follow-up Master's degree and Doctoral degree (NZ Government, 2016, p. 10–14).

Education reform paid off since the number of people with no qualifications has decreased since 1991 from 25 percent to 13 percent in 2018. Conversely, the number of people with a bachelor´s degree in education started to increase. While less than 5 percent of people achieved this level of education shortly after the reform, in 2018, it was more than 10 percent (StatNZ, 2018). Thanks to better and more equal access to education, women as well as men achieve higher education. The borders between Maori and Europeans are also beginning to disappear, while in the first half of the 20th century indigenous people did not have the same opportunities as Europeans. Thanks to this progressive approach, New Zealand is becoming a highly developed country with highly qualified people (Education Encyclopedia, 2020).

Chapter 6

Key trends in the development of selected demographic indicators in New Zealand in the period 1991–2018

In this chapter, we will focus on the description of the development of fertility, mortality and nuptiality using selected indicators described in Chapter 3.1. This chapter does not aim to give a comprehensive description of these processes, but to outline merely their development during the period between 1991–2018 for a better understanding of the current age, ethnic, religious and educational structure of the New Zealand population. The population of New Zealand was influenced by various historical, social and economic events that occurred in the second half of the 20th century (see Chapter 2.1), primarily World War II, the baby boom, women emancipation and population ageing. In this chapter, we would like to show, by using selected indicators, how these events affected the population, for example, how women´s involvement could impact the age at which they started having children, how the family could be affected by the socio-economical factors and how health care improved in terms of mortality.

6.1 Characteristics of fertility

Based on the consulted studies, we can observe the global tendency within the family to lose its key original functions such as educating children and caring for the elderly which are now fulfilled by institutions specifically designed for these needs. The 21st century family differs considerably from the 20th century family in many aspects and further changes can be expected to continue. People no longer consider important to marry or start a family, which is reflected in a decrease in the number of births (Cribb, 2009, p. 4–5).

The first changes in natality in European and English-speaking countries started at the end of the 19th century, when industrialization and urbanization came to the forefront. For women, it opened up opportunities for education and they become aware that fewer children are beneficial to them as they will be able to educate themselves, work in better jobs and have a better income (UNFPA, 2018, p. 6–7).

There has been a significant increase in fertility rates, not only in New Zealand, but also in most developed western countries in the mid-20th century. This period, called "baby boom", took place in New Zealand in 1945–1973. In this period, the population almost doubled. This has brought many social changes. Members of these cohorts, with their increasing age, put bigger pressure on various spheres of life. This was particularly in the areas of education, housing, the labour market, and at present, when these cohorts are entering retirement age, there is also increasing pressure on the pension system and health care (Stat NZ, 1995, p. 1–3).

Since the end of the baby boom, the number of children born has started to decrease significantly. There are several explanations as to why this happened. One way to explain these changes is to divide the causes into two categories: economic and non-economic-factors. The economic causes of fertility reduction are addressed in a number of theories. For example, the ones already mentioned, particularly Richard Easterleine´s analysed by Deborah Freedman (1976) or the theory of Diane Macunovich (1996). Butz and Ward (1977) also deal with the influence of economic factors on fertility. They define three main factors that have the most significant influence on the woman´s decision when they start a family and how many children their family will have. These factors are a woman´s representation in the labour market, male income and female income. This model emphasizes that, if it is a period of economic prosperity, it is the least appropriate period for women to have children, as their work opportunities and salary are at their highest level. According to this model, fertility is therefore strongly negatively correlated with the involvement of women in the labour market, which is often referred to as one of the main reasons for the declining number of births (Butz and Ward, 1979).

The factors defined in the above-mentioned theories can be also observed in New Zealand. The beginning of the second half of the 20th century was very desirable for the family in New Zealand. It was a period of economic prosperity, low unemployment and the government came up with new measures to support the family (these ones related primarily to providing housing for young families, quality and affordable health care and education). While in the early years of the baby boom these changes led to a decrease in the representation of women in the labour market and at the end of that, women have become more involved. Increasingly younger women were involved and older women held part-time jobs. More people have achieved tertiary education, giving them better jobs for more money and raising their standard of living. The women´s movements, which were most visible in the 1970s, also played an important role. These unions demanded legislative changes. The main topics for women´s rights discussions were whether to keep their children and the possibility of using protective tools against conception, equal opportunities for men and women in the labour market, preventing violence against women and children, and greater involvement of men in the home and raising children (Pool and Du Plessis, 2011).

At this time, we can see the first decrease in total fertility rate, when the value from the maximum over 4, got in 1982 below the replacement level. This downward trend persists till today. Already at the beginning of the monitored period, in 1991, the value of total fertility rate was at the border of simple reproduction and reached a value 2.09 and with slight fluctuations, it gradually decreased to 1.75 in 2018 (see Table 5). During the reporting period, there may be some fluctuations in the development of total fertility rate. The first is a gradual decline in values below

the simple reproduction. It remained at this level until 2006, when we can observe an increase until 2010, when it reached the value of 2.18 and then gradually started to decline again. This period of slight increase is referred to as the "mini baby boom". In that period, the highest fertility rate was among women aged 30–34 years. Unfortunately, the reasons why fertility rates increased during these years are not still clear (Cribb, 2009, p. 5–6). However, one possible explanation could be the introduction of a government program to support families with dependent children, which reduced taxes but also contributed financially to people if they were below a certain salary (Baker and Du Plessis, 2011).

The decreasing number of births is also related to the increasing mean age at childbearing of women. As mentioned above, there are several reasons, why women are postponing pregnancy, for example the possibility of education, interesting job offers, higher salary or the desire to have free time activities. Since 1991, we can see a gradual slow increase of mean age at childbearing of women from the age 27.93 to the 30.46 in 2018 (see Table 5).

The second group of factors that influence fertility values in New Zealand are non-economic causes. These include race, education and religion. Religion had a profound effect on the perception of marriage and family, and also affected fertility. Catholicism was characterized by an emphasis on the inseparability of marriage and large families, while Protestantism allowed divorce and families were not so numerous (Norville, Gomez and Brown, 2003, p. 12–16). For a very long time, girls were at a disadvantage in terms of the opportunities to study. Parents considered the education of girls to be unnecessary, as they were expected to get married, give birth to children, and start the household. In the course of the 20th century, the situation began to improve, with more and more women studying in universities and fields that previously were not suitable for them, such as medicine or law. Thanks to these new opportunities, women have become more interested in educational possibilities and more women have attained higher levels of education. However, the increasing length of studies has also started to shift the founding of families, and many women have also started their careers, thanks to higher education and thus also better working opportunities (Else, 2011).

Table 5: Total fertility rate and mean age at childbearing, New Zealand, selected years in the period 1991–2018

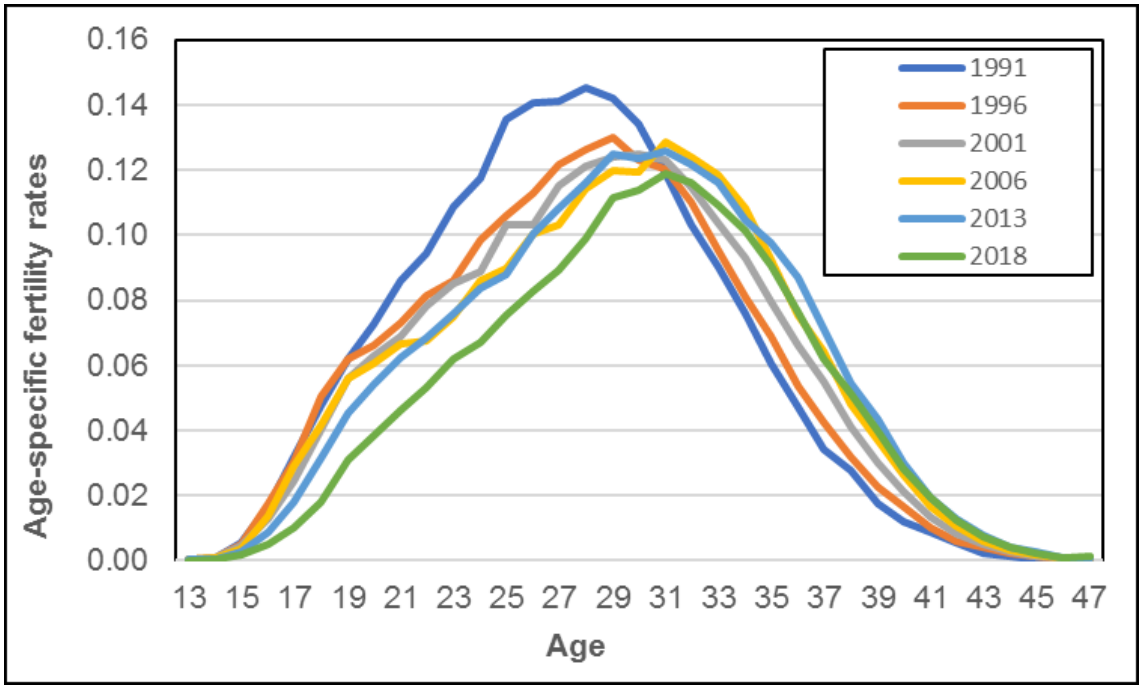
	Total fertility rate	**Mean age at childbearing**
1991	2.09	27.93
1994	1.98	28.31
1997	1.96	28.57
2000	1.98	28.96
2003	1.93	29.41
2006	2.01	29.48
2009	2.14	29.50
2012	2.10	29.78
2015	2.01	30.16
2018	1.75	30.46

Source: Stat NZ, 1991–2018, author´s adjustment

However, there are several other reasons for postponing maternity. These are connected to their financial situation where many young people do not have sufficient financial means to support child. Furthermore, there are health reasons or finding the right partner for starting a family. It can also be a negative partnership experience, and many women feel emotionally and mentally prepared to get a child and change their life at an older age. An increasing age of mothers in New Zealand can also be caused by social pressure. While in the past girls were required to get married as soon as possible and have children very soon, today the situation in most of developed countries is the opposite. Young girls are discouraged from early motherhood and women are instilled that having a baby can be without a problem even after the age of 30. If there is a problem with conceiving a child, there are the possibilities of assisted reproduction (Bellieni, 2016, p. 4–5).

The shifting of the births into higher ages can be seen in Fig. 4. In 1991, the highest fertility rates were between the ages of 24–29. Gradually fertility not only decreased but also shifted to a higher age. In 2018 it was the highest in the 29–34 age group. On the other hand, we can see that there is a decline in fertility in teenagers. It is very difficult to identify the specific causes behind this decline, mainly because of the lack of research on this issue in New Zealand. Nevertheless, the main reasons for declining fertility in teenagers in New Zealand are the use of contraception and postponing sexual activity to older age. Other generally stated reasons, include the influence of mass media (television, magazines, internet, music, movies) and also economic events, such as the economic crisis, unemployment of people in their teenage years, pregnancy prevention programmes or socio-economic disadvantages (The University of Waikato, 2013, p. 23–30).

Figure 4: Age-specific fertility rates, New Zealand, selected years in the period 1991–2018

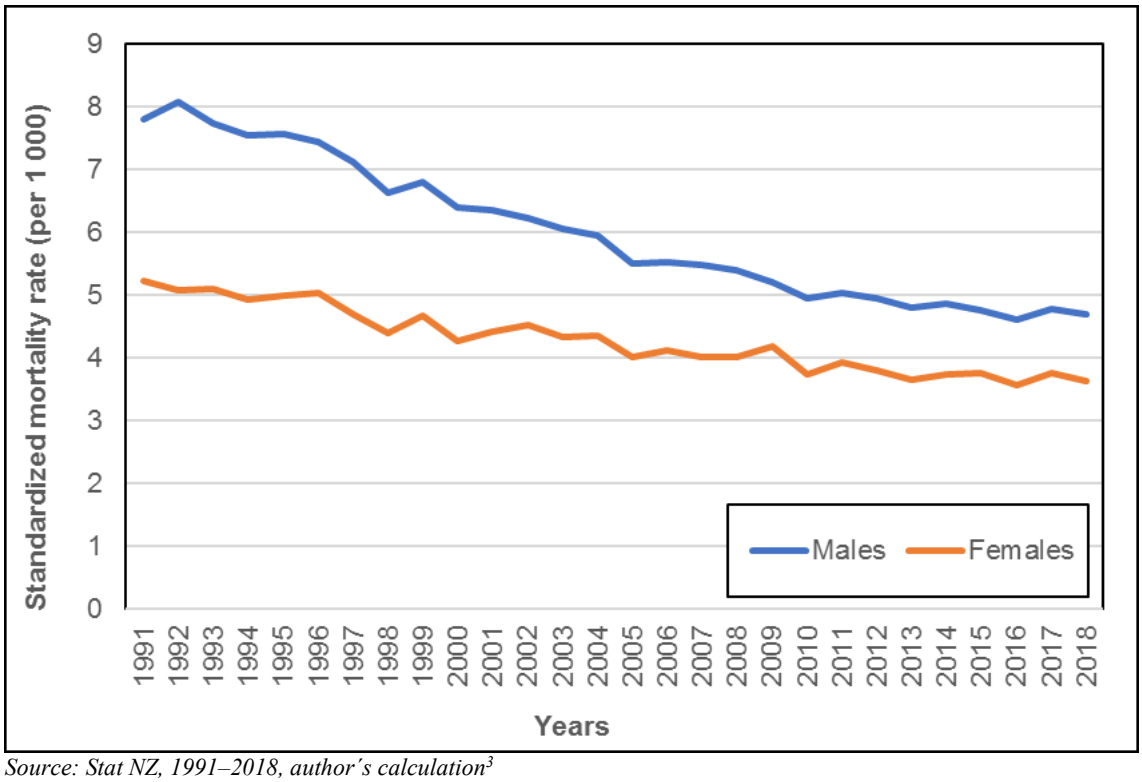


Source: Stat NZ, 1991–2018, author´s calculation

6.2 Characteristics of mortality

In the second half of the 20th century mortality began to decrease in most of the developed countries. This was due to improving living conditions and health care. New Zealand was not an exception to this trend, as we can see in Fig. 5. Both for men and women, there was a decreasing trend in standardised mortality rate over the period between 1991–2018. For women, its value dropped from 5.22 in 1991 to 3.64 in 2018. For men, it fell from 7.81 in 1991 to 4.70 in 2018. The reduction in mortality rates in New Zealand was caused by many factors, such as improvements in health care, the invention of new drugs, improving living condition, nutrition, education, etc. (Oeppen and Vaupel, 2002, p. 1029).

Figure 5: Standardized mortality rate, males, females, New Zealand, 1991–2018

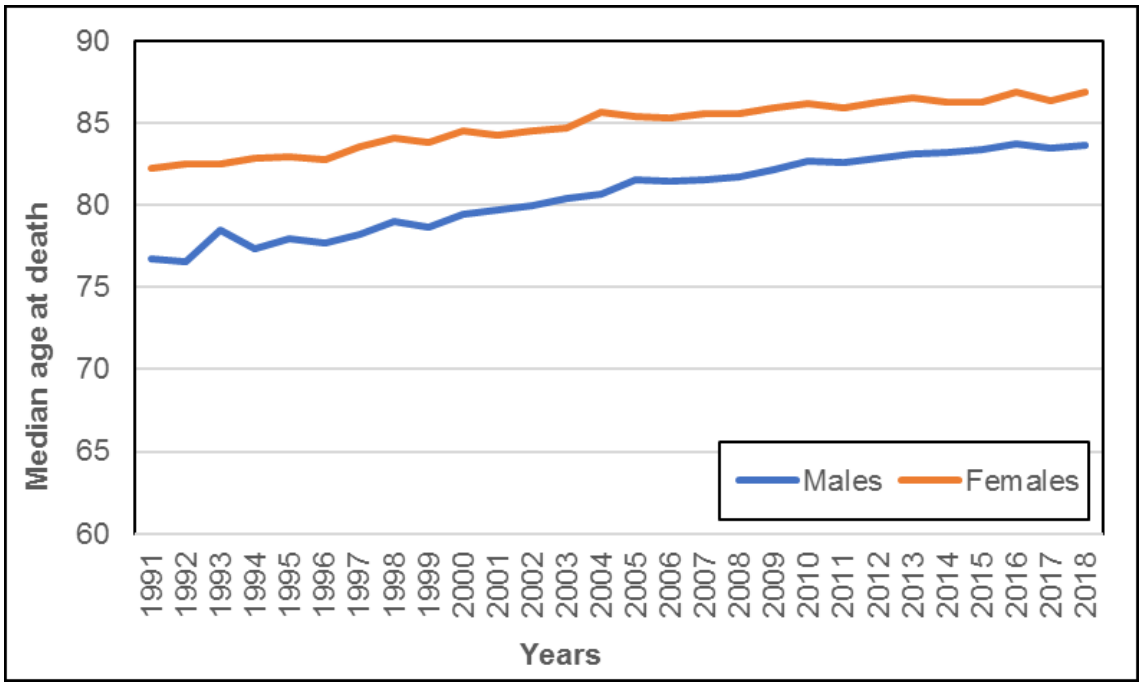


Source: Stat NZ, 1991–2018, author´s calculation[3]

Health care in New Zealand is modern and affordable. Moreover, thanks to high subsidies from the state, medical care for the New Zealanders is available free of charge or at a lower cost (NZ Government, 2020). It is the quality and available medical care and other factors mentioned above that explains the median age at death (see Fig. 6). This is valid for both sexes as we can observe an increase in the median age at death. For women, since 1991, when its value was 82.25 years, it rose to 86.85 years, while men increased from 76.71 years in 1991 to 83.61 years in 2018 (see Fig. 6).

[3] **Note**: We chose the WHO Standard population for the year 2001 (see Attachment 2) (WHO, 2001)

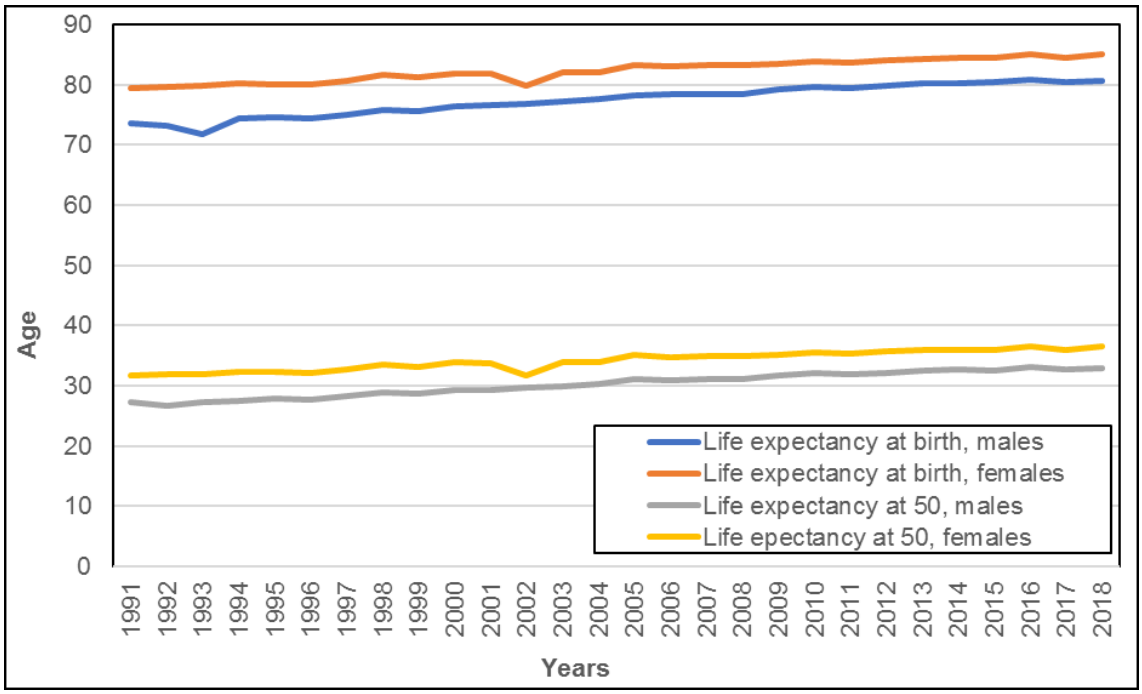
Figure 6: Median age at death, males, females, New Zealand, 1991–2018



Source: Stat NZ, 1991–2018, author´s calculation

According to a very probable scenario, life expectancy can be expected to continue to increase, mainly thanks to the continuously improving medical methods, where the preventive and diagnostic methods are now at a very high level and lots of money is also invested into the area of disease treatment (Vaupel and Kistowski, 2005, p. 6–11). Fig. 7 shows that life expectancy at birth in both sexes increased steadily between 1991 and 2018 in New Zealand. For men, the value increased from 73.52 years in 1991 by 7.2 years, to 80.73, in 2018. There was also an increase in the life expectancy of women, though not as high as men. Their life expectancy grew from 79.40 in 1991 to 85.01 in 2018. Even in case of New Zealand, we can notice that women live longer than men. There are many explanations of this phenomenon. These include, for example, higher child mortality for boys than girls. Biological factors account for a higher percentage of fat around organs in men which is associated with cardiovascular diseases. Another factor is a healthy lifestyle. Men drink alcohol and smoke on average more often than women (Ospine-Ortiz and Beltekian, 2018). There is also an increase in life expectancy at the age of 50 years for men and women. While in 1991 there were on average 31.75 years left at age 50 for women, in 2018 it was 36.58 years. For men, there was an increase from 27.25 years in 1991 to 32.97 years in 2018 (see Fig. 7).

Figure 7: Life expectancy at birth and at the age of 50, males, females, New Zealand, 1991–2018



Source: Stat NZ, 1991–2018, author´s calculation

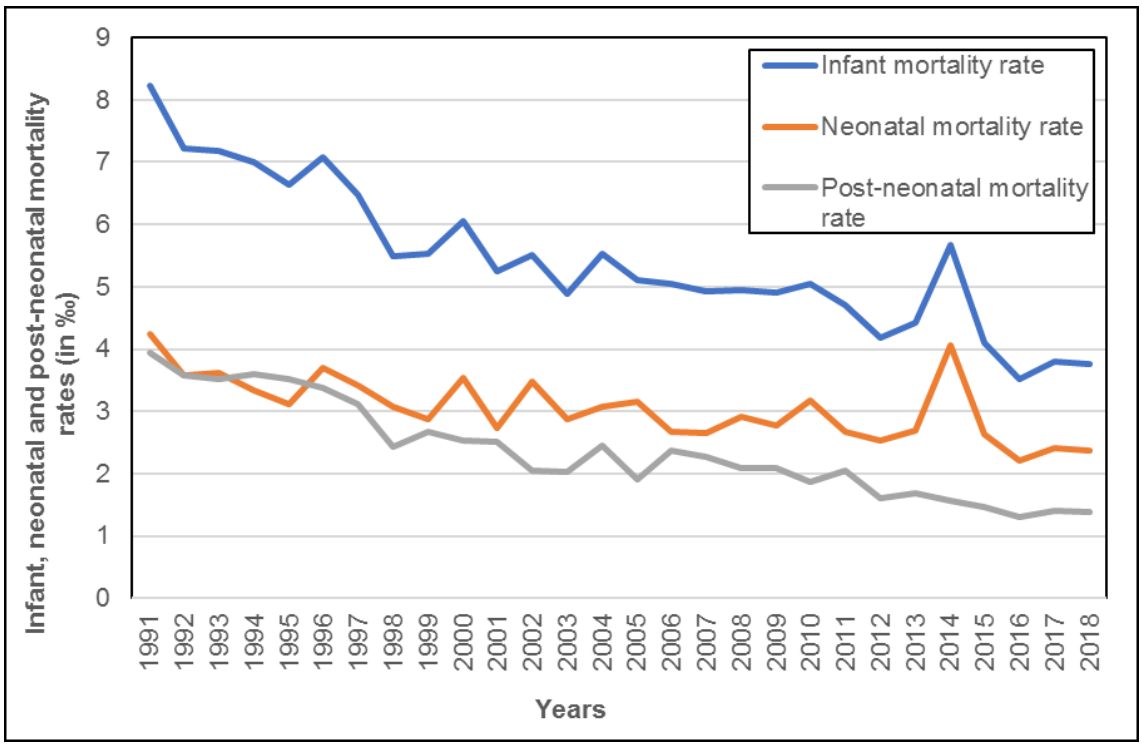
Great attention is also paid to mortality in the first year of life (neonatal, post-neonatal and infant). Fortunately, as it can be seen from Fig. 8, the progress is declining. With minor fluctuations, we can observe a decreasing trend in all three indicators. Infant mortality at the beginning of the monitored period, in 1991, was at 8.22 ‰. Nine years later, in 2000, a few years after the new sleeping position of babies was promoted, its value was around 5.5 ‰. However, in 2014 the data showed a peak in neonatal and post-neonatal mortality rates. This one was due to the late registrations from 2011 to 2013, e.g. there was a delay between the date of death and its registration. If this one had been done within the same year, the rates for 2011–2013 would have been higher, consequently in 2014 there would not have been a peak in neonatal and post-neonatal mortality rates. By 2018, it fell to 3.75 ‰. Neonatal mortality decreased from 4.24 ‰ in 1991 to 2.37 ‰ in 2018, also post-neonatal mortality significantly decreased from 3.94 ‰ in 1991 to 1.39 ‰ in 2018 (see Fig. 8).

The fact that mortality rates in the first year of life decrease significantly refers to the improvement of health care, whether during pregnancy or after childbirth. Thanks to this high-quality care and better information for women, mortality has been reduced for many causes. However, there are causes that can be prevented, but which are still responsible for mortality of babies. One of these causes is SIDS (Sudden infant death syndrome), which is mainly responsible for post-neonatal deaths. In 1991, the Ministry of Health issued a program aid at preventing SIDS. This program primarily focused on managing the position in which the child should sleep, convincing smoking mothers to stop and encouraging breastfeeding their babies (Health Quality and Safety Commission, 2017, p. 7),

The main factors that greatly affect SIDS and infant mortality (Ora, 1995, p. 7).

- Tobacco smoke
- Infant sleeping practise
- Breastfeeding
- Young age of mother
- Poor antenatal care, low birthweight and short gestation
- Bed sharing

Figure 8: Infant, neonatal and post-neonatal mortality rates, New Zealand, 1991–2018, in ‰



Source: Stat NZ, 1991–2018, author´s calculation

In the late 1990s, mothers were advised to let their babies sleep on their backs and on their side. Already this small change was reflected in a decrease in mortality. Smoking remains the biggest problem during pregnancy and breastfeeding. It is very difficult for women to stop smoking from day to day, and their surroundings may not make it easier for them if their friends are smokers as well. The issue of smoking as one of the main causes of SIDS is addressed in many studies. For example, Mitchell et all. (2017) claims that if a mother smokes during the pregnancy, it increases the possibility of SIDS up to six times. Most of the factors that contribute to SIDS can be prevented especially smoking, which is, as well as bed sharing, dependent on the will of the mother. Nowadays, when there are many contraceptive methods available, it is also the age of the mother at pregnancy. Increasing maternal responsibility would further reduce mortality in the first year of life (Health Quality and Safety Commission NZ, 2017, p. 3–9).

6.3 Characteristics of nuptiality

The average family in New Zealand has been undergoing a major transformation in recent years, as in other developed western countries. New types of families and partnerships have emerged: in addition to the traditional couples with children, more and more people are deciding not to have children at all which is reflected in decreasing values of the total fertility rate (see Chapter 6.1). Fifty years ago, most families consisted of a man who provided financial support for the family, and therefore went to work and a woman who stayed at home to take care of the household and the children (Ministry of Social Development, 2004, p. 9–22).

In the past, the law allowed only one form of union of two partners, and that was marriage. Of course, the condition was that they were adults of the opposite sex. This was strongly related to the predominant religion in New Zealand, which had been Christianity since the arrival of Europeans. However, the number of believers, not just Christians, has declined in the last few decades and according to the results of the last census in 2018, for the first time in the history of New Zealand, there are more people who do not claim any religion (see Chapter 5.3) (Law Commission, 2017, p. 14).

Religion, particularly Catholicism, also played an important role in case of homosexual discrimination. However, in 1993, the discrimination against homosexuals was prohibited based on the Human Rights Act. Then, in 2005, the Civil Union Act allowed homosexuals to enter into a civil union (Stat NZ, 2010, p. 4–5).

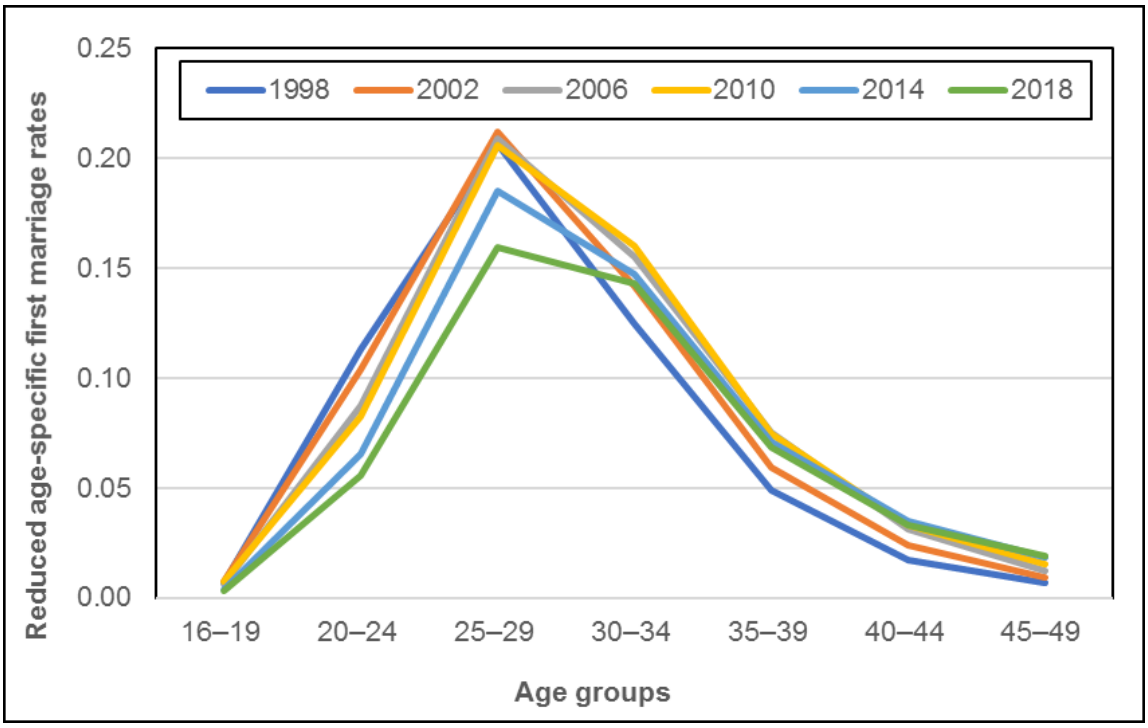
In New Zealand, there was also a change in the view of the importance of the family for women. While in the first half of the 20th century a woman was expected to get married and have children as soon as possible, with their increasing education, labour market participation and greater independence from men, their priorities have also changed. Women in New Zealand are influenced by economic stimulus, for example career growth opportunities and the related rising salary, open travel possibilities and leisure activities. Parents do not educate their children at home, but they send them to schools, as well as health care that is provided by institutions designated for this purpose (Pryor, 2009, p. 2).

The last big boom in the number of marriages in New Zealand was in the same period as the baby boom, i.e. between 1945–1973. Marriage became a matter of course for women and they were getting married at a very young age. With the positive economic development and the increasing involvement of women in the workforce and the building of their careers, the age at which women give birth to their first child has begun to increase. Also, changes in society, where the acquisition of children outside marriage and eventual divorce have become something quite normal and common, have diminished the importance of marriage, and this has ceased to be a key event in many people´s live (Ministry of Social Development, 2004, p. 25–26).

The postponement of marriage to a higher age can be observed for the selected years in Fig. 9 and 10. At the beginning of the period, in 1998, men mostly married between the ages of 25–29, nevertheless as we can see in Fig. 9, in 2018, we see that in comparison with 1998, men had a tendency to get married later between the ages of 30–34. For women, marriages in the age categories 20–24 and 25–29 prevailed in 1998. In 2010, most marriages were concentrated in the

25–29 age category. Even in the women's category, we can observe the same trend in 2018 as in the men´s one. The number of marriages concluded in the age group 30–34 does increase and on the contrary it decreases in earlier ages (see Fig. 10).

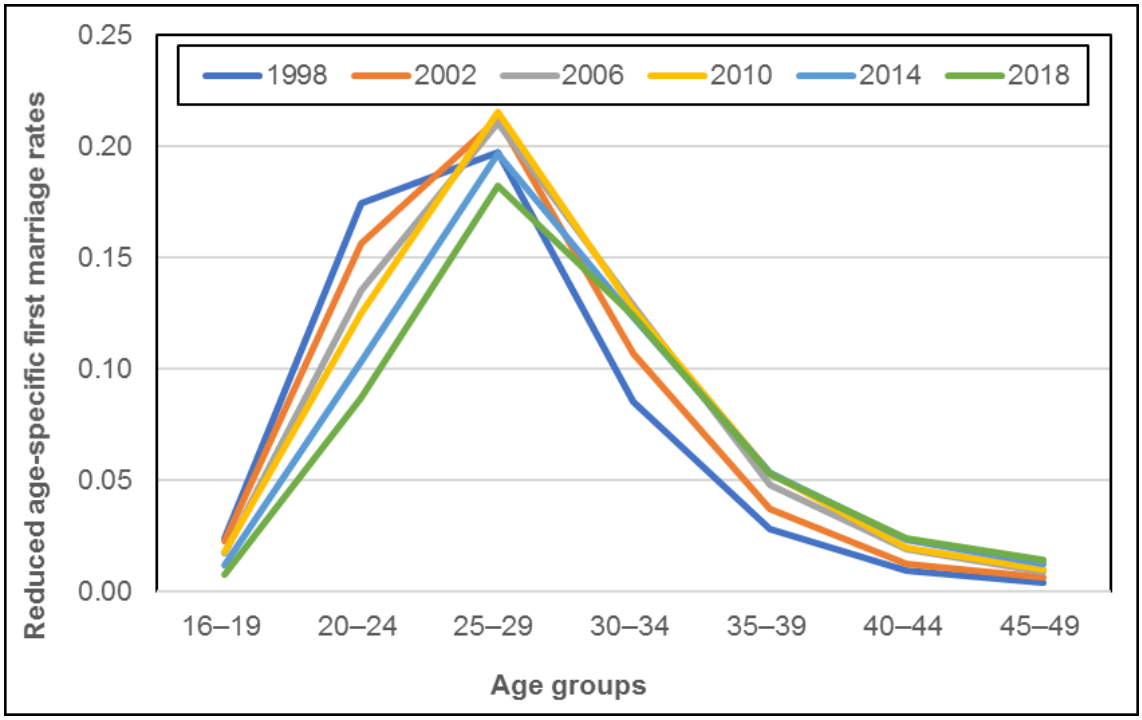
Figure 9: Reduced age-specific first marriage rates, males, New Zealand, selected years in the period 1998–2018



Source: Stat NZ, author´s calculation

There are number of theories that try to explain why women in most developed countries, as well as in New Zealand, marry earlier that men. Most theories attribute this fact to economic factors. For example, Becker in his theory argues, that the reason for an earlier marriage of women is that they are not economically self-sufficient and therefore need a husband to give them this support (Becker, 1991). However, Oppenheimer, who emphasizes that the role of women in society has changed dramatically over time, reserves this statement. According to her, women are no longer looking for a husband for financial security, but as their education, equality and working opportunities have improved, many women are starting to push marriage on their own so that they can build their economic independence. The later marriage of men is usually associated with their desire to become economically self-sufficient (ensure good earnings so they could feed their future family well (Oppenheimer, 1988).

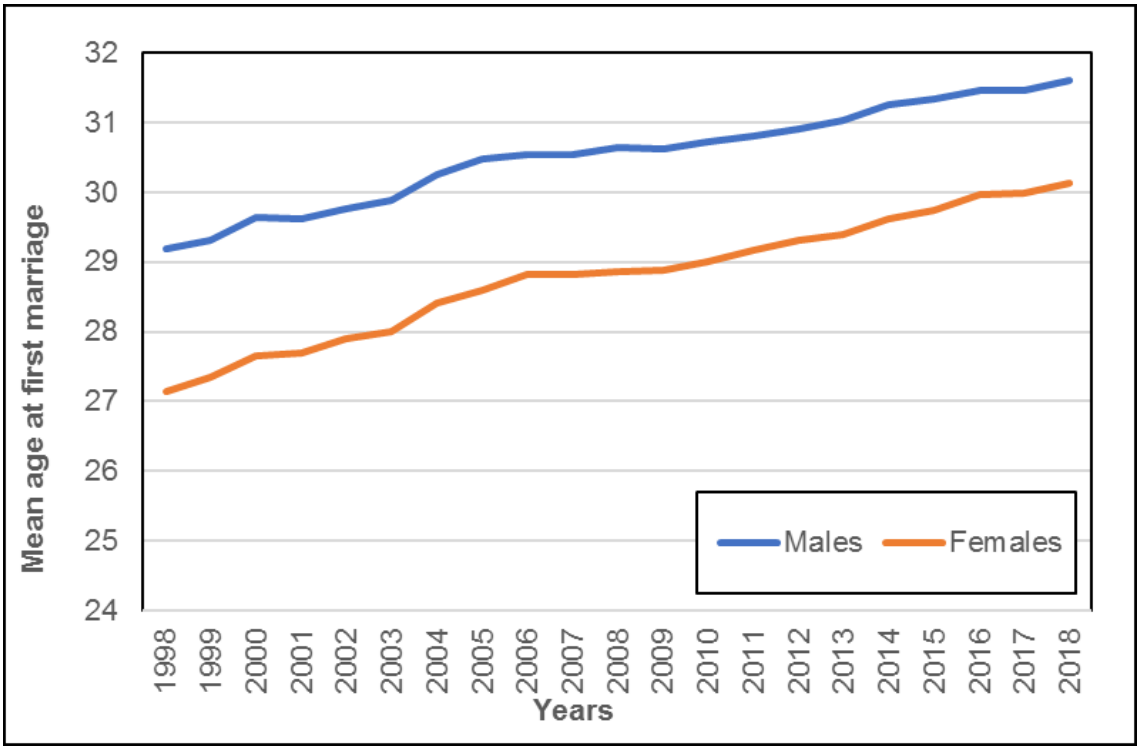
Figure 10: Reduced age-specific first marriage rates, females, New Zealand, selected years in the period 1998–2018



Source: Stat NZ, 1998–2018, author´s calculation

There has not only been changes in the view of the family, but there have been changes in the division of family roles between men and women. While in the 1970s, women were most interested in family and home, men had to involve themselves with work not so much for the family, but rather for the interests outside the home. As women´s view on marriage and family formation changed, so did their view on shared roles in the family. While earlier, women were almost all out of work, it was expected they should do most of the housework, but with the involvement of women in the labour market and their emancipation, there have been significant changes in this area. Men have gradually become more involved in former female household tasks, such as childcare, and many men are assuming a maternal position, especially when women have higher salaries than men. They are also more involved in housework, such as cooking, washing and ironing (Ministry of Social Development, 2004, p. 43).

Figure 11: Mean age at first marriage, males, females, New Zealand, 1991–2018



Source: Stat NZ, 1998–2018, author´s calculation

The aforementioned factors affecting New Zealand women when starting a family, i.e. the availability of education, working possibilities and greater independence from men, are also reflected in the marriage age. In 1998, women entered their first marriage at 27.15 years and men at 29.19 years. From Fig. 11 we can see a constant increase of this age to the value 30.12 years for women and 31.59 years for men in 2018. Together with women, the increasing age of men may be caused by greater opportunities for education and work, and that is one of the possible explanations why they are also postponing marriage to an older age (see Fig. 11).

6.4 Summary

This chapter outlined the basic development of demographic processes of fertility, mortality and nuptiality. In the description of fertility, we managed to show that compared to the peak period of the baby boom, when the value of total fertility rate was over 4, from the 1980s we can observe its gradual decline, which has lasted until today, below the limit of simple reproduction (Cribb, 2009, p. 5–6). A possible explanation for this change may be the emancipation of women, which began to develop significantly in New Zealand in the 1980s. It was related to the increase in education of women, their desire for better working conditions and possibilities, the development of their own careers and economic independence from men (Pool and Du Plessis, 2011).

New opportunities have begun to open up for women since the last quarter of the 20th century. They have changed their view on early marriages and early family formation (Else, 2011). These facts were reflected in the growing age at childbearing, which in 2018 exceeded the value of 30

years. Also, the age of the first marriage is gradually beginning to move into the 30–34 years category for both sexes (see Chapter 6.3).

New Zealand also boasts very good living conditions and quality health care. Due to these factors, mortality decreases in the first year of life and life expectancy in both sexes increases. This means that people are living on average longer (Vaupel and Kistowski, 2005, p. 6–11). However, this positive trend brings increased demands on health care from the seniors in the future, as well as higher pension costs. The situation is complicated by the fact that numerically strong generations from the baby boom period are now beginning to get to retirement age. The pressure to secure the elderly will thus be considerable in the future (Badkra, Callister and Didham, 2009, p. 5–7).

This basic analysis of the demographic processes permits us to find answers to our research assumptions (see Chapter 2.2). Based on the defined historical, social and economic processes and events, we were able to explain fluctuations and peaks in the development of defined indicators.

Chapter 7

Conclusion

The aim of this theses was, firstly, to describe the essential demographic processes within the period between 1991–2018, then characterize New Zealand´s population based on age, ethnicity, religious and educational structure as well as to present key historical and economic events which had an impact on the population. In order to meet this objective, two research assumptions were set and the answers to these ones were provided in the theoretical and empirical section:

1. *As the first generations of baby boomers (1945–1973) are retiring, the population ageing becomes key social and political issue as the economic impacts, such as pensions, tax income, health care, will have crucial consequences on the population.*

2. *During the second half of the 20th century, thanks to better economic conditions and possibility to access to higher education, the traditional family was no longer women´s primary interest as they preferred to focus on their careers. This was one of the reasons for shifting maternity into higher age and decrease of fertility.*

The theoretical part (see Chapter 4) focused on the history of New Zealand and description of economic, historical and social events that have influenced the population and helped us to better understand the following development and changes in population behaviour. This was the Second World War, the baby boom in the period between 1945–1973, economic development during the second half of the 20th century and the growing emancipation of women, which was reflected in their higher education and participation in the labour market. Chapter 5 describes the characteristics of New Zealand's population, in terms of age, ethnic, religious and education structure. Chapter 6 was dedicated to describe the development of fertility, mortality and nuptiality in New Zealand in the period between 1991–2018 using selected basic demographic indicators.

Based on the study of the relevant literature related to population ageing and the description of the characteristics of New Zealand´s age structure in the period between 1991–2018 and with the help of age pyramids, aged-child ratio, young-age dependency ratio and old-age dependency ratio, we can say, that the ageing of the population is currently a key issue and will be even more fundamental in the future. We can see a significant increase in the proportion of people in the range of 65 and above since 2010, when the first generations of people born after World War II

and the onset of the baby boom began to emerge at this age. A high proportion of the elderly will require social changes, in particular the provision of health care and sufficient funds for pensions. Population ageing is starting to be a major problem, as a large number of people of "baby boom" generations will be heading towards retirement age in the coming years, due to the increasing life expectancy at birth, which was 80.73 for men in 2018 and 85.01 for women (see Chapter 6.2).

However, the ageing population is not the only key issue. Similarly, there is a serious decline in fertility. In the monitored period between 1991–2018, we can observe a decreasing trend of total fertility rate (see Chapter 6.1). One explanation is precisely the employment of women who, according to the values of median age at childbearing, increasingly postpone the birth of children up to the age of 30 and more. With increasing age, there are greater problems with pregnancy and often women in older age manage to have only one child. This is a worldwide trend in most western developed countries. The New Zealand government is therefore trying to encourage women to have as many children as possible. These include mainly the possibility of having home office and part time jobs or various financial benefits per child (Else, 2011)

Changes can also be observed in the development of nuptiality, for example, on the values of the mean age at first marriage. Its value for both sexes increases linearly during this period. While at the end of the 20th century women had their first marriage at around 27 years of age, in 2018 it was already at 31. A similar increase can also be seen for men. They get married in 2018 first on average around 31.59 years old (see Chapter 6.3). The participation of women in the labour market and building their security is also likely to have had a share in this decline. Another factor is the social acceptation of singles, new forms of cohabitation and the decline of believers in religions (Stat NZ, 2010, p. 4–5).

To sum up, based on our study, we can constat that New Zealand´s population development during 1991–2018 was influenced by certain historical events, e.g. World War II, the social events, e.g. baby boom and women´s emancipation as well as the economic prosperity thanks to that women could be involved in the labour market. Our approach to achieve the aim of our thesis was to synthetize the available literature as well as the results obtained from the calculation of our selected demographic indicators. However, due to the limited scope of this work, we were not able to examine all available data and, also, we were not able to cover all topics which would have been studied in order to provide the full description of all factors that could have influenced New Zealand´s population, particularly we were not able to study all data available in New Zealand's Statistical Office. The topics that could be covered in the future studies are, for example, causes of death, characteristics of the process of divorce or migration. In addition, it would be beneficial to do a deep analysis of the fertility, mortality and nuptiality as we only did a superficial analysis of these processes.

One of the crucial points of view that was not covered here is the distinction of the population development between Pakeha and Maori. In addition, we suppose that it would be valuable to perform a comparative study with the Commonwealth countries and to see which indicators played critical roles in the population development so it might be possible to identify other indicators that have not been studied in the thesis.

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Attachments

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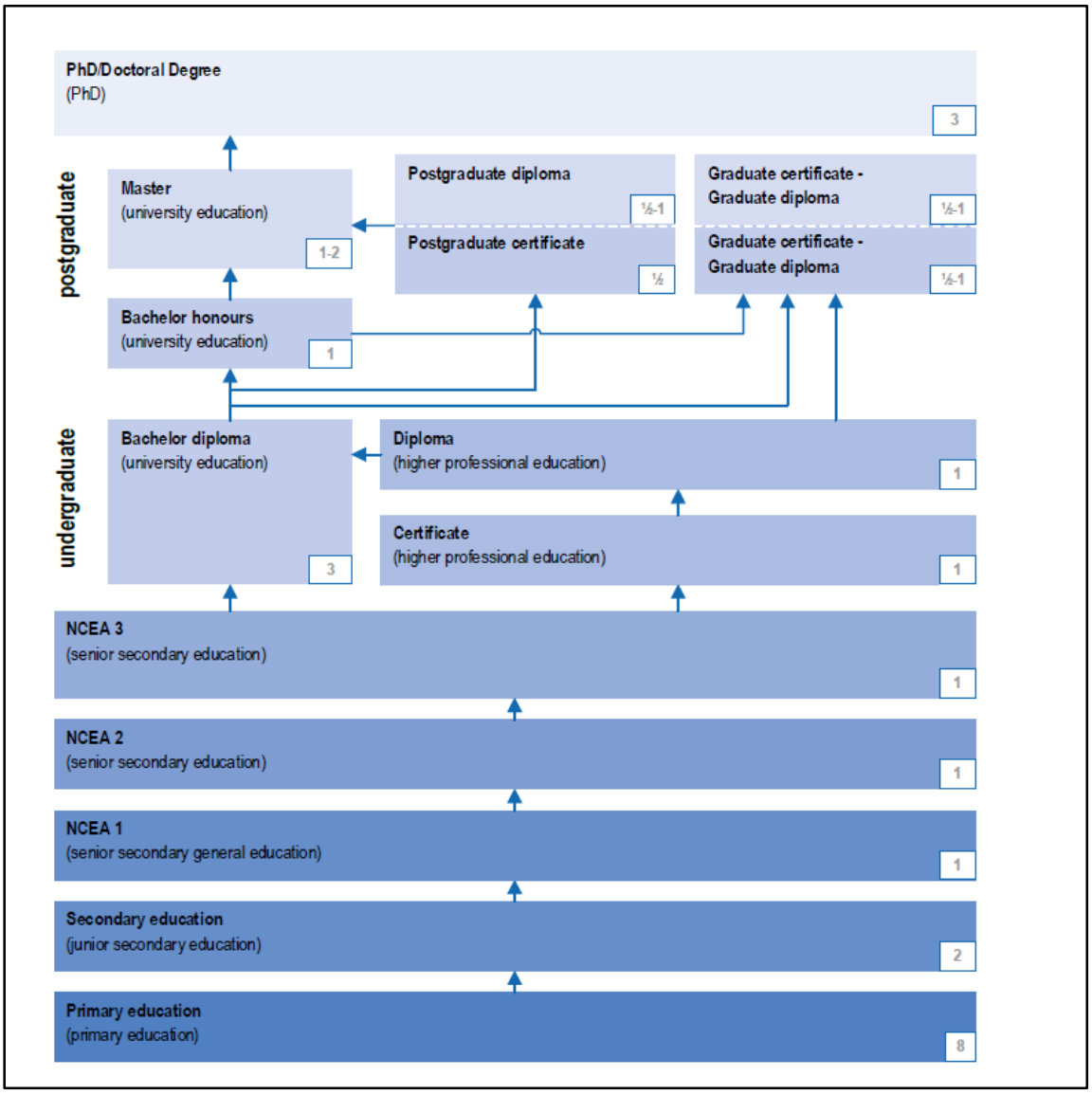
1. Education system New Zealand



Source: NUFFIC, 2015, p. 3

2. The table of used data

Type of data	Available period	Available ages	Applicability	Online available
Deaths by age and sex	1948–2019	Less than 1 year–100 years and over	Life tables, Direct standardization	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=58ac3b08-af66-40d2-b5eb-932acd144b59
Estimated Resident Population by Age and Sex	1991–2019	Less than 1 year–100 years and over	Life tables, Direct standardization	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=56a65e6c-1f19-4bb2-bd92-aeab337c2867
Infant deaths	1930–2019	Under one year of age	Infant mortality rate	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=56a65e6c-1f19-4bb2-bd92-aeab337c2867
Neonatal, post-neonatal deaths by area, regional councils	1991–2019	Deaths under 28 days and deaths between 28 and 364 days of age	Neonatal and postneonatal mortality rate	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=47129492-6df0-47a7-ae9a-1482704d9739
Live births by age of mother	1962–2019	Under 14 years–47 years and over	Age-specific fertility rate, Total fertility rate, Mean age at childbearing	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=26c82459-9f66-4b32-9ba6-a11bef091fe1
Marriages and civil unions by age and previous marital status	1998–2018	16–65 years and over	Age-specific rate at first marriage, Mean age at first marriage	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=3456f6c8-b184-48dd-bf73-2ed84fabb463
Estimated Resident Population by Age and Sex	1991–2019	Less than 1 year–90 years and over	Age index, Youth dependency ratio, Elderly dependency ratio	http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=69e6ac45-6c34-4104-981b-8929e7f02533

Source: Stat NZ, author´s adjustment

3. WHO Standard population 2001

	Px^{st}
0	1822
1–4	7033
5–9	8687
10–14	8597
15–19	8474
20–24	8222
25–29	7928
30–34	7605
35–39	7145
40–44	6590
45–49	6038
50–54	5371
55–59	4547
60–64	3723
65–69	2955
70–74	2210
75–79	1515
80–84	905
85+	632
Total	99999

Source: WHO, 2001